

F-59



TRANSLATION FROM JAPANESE

Japan Patent Office (JP) Patent Publication (A) Publication of Patent Application
 62 - 254786
 Published: 6th November 1987

(51) Int. Cl.	Identification symbol	Internal Ref. No.	FI	Technical designation
A 63 F 9/00	102	B-8102-2C		

Examination: requested
 No. of claims: 1 (Total : 11 pages)

(54) Title of the Invention:	Rotating drum type amusement machine
(21) Application No.:	S61-97650
(22) Application Date:	26 th April 1986

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SPECIFICATION

1. Title of the Invention

Rotating drum type amusement machine

2. Claims

1. A rotating drum type amusement machine comprising:
 - a) normal game means consisting of at least three picture reels having pictures of different types depicted on the circumferential faces thereof, and first driving devices, provided respectively for each of the picture reels, for causing said picture reels to rotate;
 - b) subsidiary game means consisting of a rotating member having a suitable number of differing symbols depicted on the surface thereof, and a second driving device for causing said rotating member to rotate;

- c) first stopping means for supplying stop signals individually to the respective first drive devices, in accordance with a deliberate operation;
- d) first detecting devices for detecting the stop positions of the respective reels when the rotation thereof is halted;
- e) normal game judging means for judging whether or not a prize has been won on the basis of the detection signals from the first detecting devices, and issuing a start signal for a subsidiary game in the case of a particular prize combination;
- f) second stopping means for supplying a stop signal to the second drive device;
- g) a second detecting device for detecting the stop position of the rotating member when the rotation thereof has halted;
- h) subsidiary game judging means for judging whether or not a prize has been won on the basis of the detection signal from the second detecting device; and
- i) hopper driving means for driving a hopper in such a manner that it pays out corresponding tokens, when a signal from said normal game judging means or a signal from said subsidiary game judging means is input thereto.

3. Detailed Description of the Invention

(Industrial Applicability)

The present invention relates to a rotating drum type amusement machine, as typified by a slot machine. More particularly, it relates to a rotating drum type amusement machine which can be played with greater interest.

(Prior Art)

A rotating drum type amusement machine, such as a slot machine, generally uses three picture reels provided with a cylindrical face depicting a plurality of pictures, these reels being caused to rotate and the respective picture reels then being stopped by a player pressing stop buttons provided for each reel, whereby the respective picture reels are caused to stop at random, and a prize is determined according to the combination of pictures in a previously determined the prize line, a prescribed number of tokens being paid out if the player has won a prize.

Figs. 8 to 9 show an approximate front view of a conventional rotating drum type amusement machine (Z) of this kind, and a prize line in a front panel (21) and picture reels, or the like, as viewed through a reel window.

The aforementioned rotating drum type amusement machine (Z) is also known as a "slot machine", and comprises a box-shaped housing, inside which are

accommodated three picture reels (1), (2), (3), motors for causing same to rotate, and other control devices and the like. 21 pictures of 7 different types, for example, are depicted in a random order on the respective outer circumferences of each of the aforementioned picture reels (1), (2), (3). Moreover, on the front panel (21) of the front upper portion of the machine, there are provided: a reel window (22) so that the player can see through to the pictures on the picture reels (1), (2), (3); a start switch (10) for causing the respective picture reels (1), (2), (3) to rotate; stop buttons (11), (12), (13) for stopping the rotation of the aforementioned picture reels (1), (2), (3), independently; a token input slot (9); a line display device (23) for displaying the positions and number of prize lines; and the like.

In this amusement machine (Z), five prize lines are provided corresponding to the three rows of picture reels (1), (2), (3) appearing in the reel window (22), and a prescribed position and number of prize lines can be selected mechanically from these five prize lines, by means of the number of tokens input. In other words, the machine is previously set up in such a manner that, if the number of tokens input by the player to the token input slot (9) is one token, then only the centre line (I) is selected, and in the case of two tokens, the lines above and below the centre line (I), namely (IIa), (IIb), are added to provide three prize lines, whilst if three tokens are input, then the diagonal lines (IIIa), (IIIb) are also added to provide five prize lines.

The game in this conventional amusement machine (Z) consists of one, three or five prize lines being selected according to the number of tokens input by the player to the token input slot (9), whereupon the line display device (23) indicating the prize lines lights up to inform the players the number and positions of the prize lines. The player then presses the start switch (10), causing the respective picture reels (1), (2), (3) to rotate, and thereby starting the game. Thereupon, as illustrated in Fig. 10, when the player presses the stop buttons (11), (12), (13), respectively, in a desired sequence (201), the picture reels (1), (2), (3) stop rotating, and when all of the picture reels (1), (2), (3) have stopped (202), a prize is determined according to the combination of pictures which have stopped on the aforementioned prize lines (203). If a prize has been won, then a prescribed number of tokens are paid out (204) (hereinafter, this game is called "normal game").

The rotational speed of the respective picture reels (1), (2), (3) described above is a speed whereby the pictures on the outer circumferences are difficult to discern clearly, and in most cases, the player simply presses the stop buttons (11), (12), (13), at

random, but to some extent, he or she is able to stop the picture reels (1), (2), (3) at desired stop positions, in a deliberate manner. Therefore, a rotating drum type amusement machine (Z) of this kind stimulates the interest of the player, sufficiently, and allows him or her to play an interesting game.

In a conventional amusement machine (Z) of this kind, in order to further increase the interest generated by the game, it has also become possible to play a continuation bonus game using one picture reel only, in addition to the aforementioned normal game. A continuation bonus game is also known generally as a small bonus game, wherein, after the picture reels have rotated and each picture reel has been stopped, one at a time, if any one of the picture reels has stopped at a picture indicating a continuation bonus, then a prescribed number of tokens are paid out.

A continuation bonus game can be achieved by operating a built-in continuation bonus device, if a prescribed prize combination is obtained in the prize combinations of the normal game. Moreover, it is also possible to adopt a composition comprising a continuation bonus increasing device which allows large bonus games to be played by increasing the number of games of the continuation bonus game itself, thereby further enhancing the player's interest in the game.

(Problems to be Solved by the Invention)

The conventional amusement machine (Z) described above is widely used to play very entertaining games wherein the stopping position of the picture reels are determined by a combination of an element of chance and an element of the player's skill in pressing the stop buttons in a deliberate fashion.

As a result of continued and thorough research into amusement machines which might enable more interesting games to be played, the present inventor discovered that a more interesting game might be possible if a chance for playing a small bonus game or large bonus game (hereinafter, called "subsidiary game") could be imparted by some means other than the picture reels, when a particular prize combination is obtained in a normal game.

The present invention provides a new rotating drum type amusement machine completed on the basis of this finding.

(Means for Solving the Problems)

The rotating drum type amusement machine according to the present invention is now described on the basis of Fig. 1.

The present invention is characterized in that it comprises: (a) normal game means consisting of at least three picture reels (1), (2), (3) having pictures of different types depicted on the circumferential faces thereof, and first driving devices (5), (6), (7), provided respectively for each of the picture reels (1), (2), (3), for causing said picture reels (1), (2), (3) to rotate; (b) subsidiary game means consisting of a rotating member (81) having a suitable number of differing symbols depicted on the surface thereof, and a second driving device (84) for causing said rotating member (81) to rotate; (c) first stopping means (11), (12), (13) for supplying stop signals individually to the respective first drive devices (5), (6), (7), in accordance with a deliberate operation; (d) first detecting devices (15), (16), (17) for detecting the stop positions of the respective reels (1), (2), (3) when the rotation thereof is halted; (e) normal game judging means for judging whether or not a prize has been won on the basis of the detection signals from the first detecting devices (15), (16), (17), and issuing a start signal for a subsidiary game in the case of a particular prize combination; (f) second stopping means (14) for supplying a stop signal to the second drive device (84); (g) a second detecting device (87) for detecting the stop position of the rotating member (81) when the rotation thereof has halted; (h) subsidiary game judging means (32) for judging whether or not a prize has been won on the basis of the detection signal from the second detecting device (87); and (i) hopper driving means (33) for driving a hopper in such a manner that it pays out corresponding tokens, when a signal from said normal game judging means (31) or a signal from said subsidiary game judging means (32) is input thereto.

The aforementioned rotating member (81) may be of any form, provided that symbols, such as numerical figures, images, or the like, are depicted on the surface thereof, and for example, a circular disc having numerical figures or images depicted on a circumferential fashion on the surface of the disc, or a reel having numerical figures or images depicted on the outer circumference thereof, may be used. The aforementioned second stopping means (14) may also be operated by deliberate human operation, or it may be operated automatically.

(Action)

In the present invention, three picture reels (1), (2), (3) are caused to rotated by first drive devices (5), (6), (7). When first stopping means (11), (12), (13) are operated intentionally after the reels have started to rotate, then the three picture reels (1), (2), (3) are stopped at rotational positions corresponding to the times at which they were

operated. The rotational stopping positions of the respective picture reels (1), (2), (3) when they are halted are detected respectively by first detecting devices (15), (16), (17).

In this way, when one round of a normal game ends, it is determined by normal game determining means (31) whether or not the stopped pictures of the respective picture reels (1), (2), (3) form a combination corresponding to a prize, on the basis of the stop signals from the first detecting devices (15), (16), (17), and if a prize has been won, then a start signal for a subsidiary game is issued.

The subsidiary game begins with a rotating member (81) starting to rotate in accordance with said start signal. The rotation of the rotating member (81) is halted by operation of second stopping means (14), and subsidiary game determining means (32) then determines whether or not the symbols displayed when it stops form a combination corresponding to a prize. If a standard prize was obtained in the normal game, then at this point, hopper driving means (33) operates and pays out corresponding tokens, and one round of the game finishes without proceeding to the subsidiary game. If a particular prize is obtained in the normal game, then the tokens corresponding to the normal game are paid out, and the machine then also transfers to the subsidiary game. If a prize is won in the subsidiary game, then at that point, the continuation bonus device or continuation bonus increasing device is activated, and a small bonus game or large bonus game can be played. Moreover, if no prize is won during the normal game, then one round of the game ends without any tokens being paid out, and if no prize is won in the subsidiary game, then the game ends directly, and the machine returns to its original state.

(Embodiments)

Next, embodiments of the present invention will be described.

Fig. 1 is a functional diagram of the present invention; Fig. 2a shows a front panel of a rotating drum type amusement machine relating to a first embodiment of the present invention; Fig. 2b - 2d shows principal front views of circular discs forming rotating members; Fig. 3 is an electrical circuit diagram of the first embodiment; Fig. 4 is a flow chart showing the game contents of the first embodiment; Fig. 5 is a flowchart showing the game contents of a second embodiment; Fig. 6 is a flowchart showing the game contents of a third embodiment; and Fig. 7 is an explanatory diagram of a subsidiary reel forming a rotating member according to a fourth embodiment.

In Fig. 2a, (21) is a front panel of a slot machine relating to the present embodiments. Three reel windows (22) are provided in the centre of said front panel

(21), through which three lines of pictures on picture reels (1), (2), (3) for a normal game can be viewed. The picture reels (1), (2), (3) have, for example, 21 pictures of 7 different types depicted on the outer circumferences thereof, within boxes provided at equal pitch. These picture reels (1), (2), (3) are supported by an installation frame on the inside of the main unit, and stepping motors (5), (6), (7) constituting first driving devices are connected respectively to the rotational shafts thereof. Control type motors, such as DC motors or AC motors, may be used as the aforementioned first driving devices. (I), (IIa), (IIb), (IIIa), (IIIb) are respective prize lines, and lines indicating these prize lines are depicted on the reel windows (22).

A circular disc (81) forming a rotating member for a subsidiary game is provided on the upper portion of the front panel (21). This circular disc (81) is supported on an installation frame inside the main unit, and the rotational shaft thereof is connected to a stepping motor (84) constituting a second driving device. A control type motor, such as a DC motor or AC motor, may be used for said second driving device.

As illustrated in Fig. 2b, said circular disc (81) shows figures from 1 to 12 within boxes demarcated in circumferential fashion on the disc, on which blank boxes are also provided. Moreover, as shown in Fig. 2c, a disc depicting single circles or double-circles instead of the aforementioned figures, or a disc depicting pictures, such as diamond or star shapes, or the like, instead of these circle symbols, may also be used.

A stopping mark (71) indicating one figures or picture is provided above the circular disk (81). The probability of winning a prize in the subsidiary game is set by a ratio of the prize symbols compared to the total number of boxes, and therefore, the number of prize symbols should be determined in accordance with the desired prize probability. For example, in the case of the circular disk (81) in Fig. 2b, the odd numbers (6 boxes) are allocated to continuation bonus prizes, the even numbers (6 boxes) are allocated to continuation bonus increase prizes, and the blank boxes (8 boxes) are allocated to no prize. Moreover, in the case of the circular disk (81) in Fig. 2c, the single circle symbols or star symbols (6 boxes) are allocated to continuation bonus prizes, the double circle symbols or diamond symbols (6 boxes) are allocated to continuation bonus prizes [*sic*], and the blank boxes (8 boxes) are allocated to no prize.

The following description relates to a case where a circular disk (81) as shown in Fig. 2b is used, but the case of a circular disk (81) as shown in Fig. 2c should also be understood similarly.

In addition to the foregoing, there are also provided on the front panel (21): a payment display device (24) for displaying the amount of tokens to be paid out when a prize is won; a token input slot (9) for inserting a prescribed number of tokens for each game; a start switch (10) for activating the respective picture reels; stop buttons (11), (12), (13) provided corresponding to each of the picture reels (1), (2), (3), for stopping the respective picture reels (1), (2), (3); a stop button (14) for stopping the aforementioned circular disk (81); and the like.

Next, an electrical circuit is described on the basis of Fig. 3. (30) is a microcomputer for controlling the entire slot machine. This microcomputer (30) performs the necessary comparisons and judgements required in implementing the game, on the basis of input signals, and it comprises: a CPU for outputting these results as control signals; a ROM for storing procedures for making comparisons and judgements in the CPU, programs for determining the order in which such steps are implemented; and combination data, and the like, for the prize-winning stop pictures and the prize-winning stop figure required to determine prize winning in a normal game and a subsidiary game; a RAM for storing other data; and an input port (36) for selecting the timing combination of external signals and internal signals, and input/output signals, and an output port (35) for outputting control signals (35).

The stepping motors (5), (6), (7) are connected via a drive circuit (38) to the output port (35), in such a manner that whilst a pulse-shaped control signal is supplied from the CPU, a drive signal is transmitted by the drive circuit (38), thereby causing the stepping motors (5), (6), (7) to rotate.

The start switch (10), respective stop buttons (11), (12), (13), (14), respective detection sensors (15), (16), (17), and the token output device (41) are connected respectively to the input port (36). An start up circuit (47) and stopping circuit (48) are interposed respectively in the signal line from the aforementioned start switch (10) and the signal line from the respective stop buttons (11), (12), (13), (14). Said position detecting sensors (15), (16), (17) detect a reset signal section provided at one point on the circumference of each of the picture reels (1), (2), (3), and are constituted by photosensors, for example, in such a manner that they issue a reset signal once for each revolution of the picture reels (1), (2), (3).

Said token detecting section (41) detects the fact that tokens have been input to the token input slot (9), and the number of tokens thus input, and a micro-switch, photosensor, or the like, may be used for same.

Moreover, a stepping motor (84) for causing the circular disk (81) to rotate is connected between the output port (35) and input port (36). This stepping motor (84) receives a drive signal from the drive circuit (39), whilst a control signal is issued by the CPU, whereby it is caused to rotate. When the stop button (14) is pressed, the drive signal from the CPU is halted, and the rotation of the stepping motor (84) stops. A position detecting sensor (87) detects a reset signal provided at one point on the circumference of the circular disk (81), and is constituted by a photosensor, for example, in such a manner that it issues one reset signal for each revolution of the circular disk (81).

The output port (35) is connected, via respective drive circuits (44), (45), (46), to: a hopper (42) for paying out corresponding tokens when a prize has been won; a speaker (43) for playing different tuneful melodies when different prizes are won; and a payout display unit (24) for displaying the number of tokens corresponding to the prize (for example, 2, 5, 8, 10 or 15 tokens).

In this embodiment, when a player inputs a token to the token input slot (9) with the power supply switched on, a detection signal for same is sent to the CPU by the token detecting unit (41), and the CPU sets the slot machine to an active state, whilst also issuing a drive signal to the speaker (43) in such a manner that a previously determined melody is played.

In this state, if the player then presses the start switch (10), then a start signal is fed to the CPU, which in turn issues drive signals simultaneously to the stepping motors (5), (6), (7), whereby the picture reels (1), (2), (3) all start to rotate. Thereupon, if the player presses one of the stop buttons (11), (12), (13), a stop signal is fed to the CPU, and immediately, the drive signal from the CPU is halted and the rotation of the picture reels (1), (2), (3) is halted. The stepping motors (5), (6), (7) rotate precisely in reaction to the drive signals, and when the player performs a push button operation, they halt almost instantaneously. Therefore, the player is able to freely select the order and time intervals by which he or she presses the stop buttons (11), (12), (13), so as to halt the respective picture reels (1), (2), (3) in desired positions.

Normal game determining means (31) and subsidiary game determining means (32) are achieved by software processing in the microcomputer (30).

Judgement of prizes in a normal game is performed in the following manner. The CPU counts the number of pulses of the drive signal from the time at which the last reset signal was input, of the reset signals input at each revolution of the picture reels

(1), (2), (3) from the position detecting sensors (15), (16), (17), to the time at which the stop signal is input and the transmission of the drive signal to the stepping motors (5), (6), (7) is halted. Since the number of pulses of the drive signal required to rotate one picture box section depicted on the picture reels (1), (2), (3) is already known, it can be judged which boxes of each picture reel (1), (2), (3) appear in the reel window (22), according to the counted number of pulses. In order to judge prize winning, the combinations of different types of pictures which relate to prize winning are stored in a prescribed area of the ROM. The CPU takes the number of counted pulses as an instance, and compares this with the information in the ROM. If the compared information matches, then a prize has been won, and the type of prize is also determined.

Judgement of prize winning in a subsidiary game is performed by means of the CPU detecting the stopped figure on the circular disk (81), on the basis of the reset signal from the position detecting sensor (87), similarly to the case of the picture reels (1), (2), (3) described above, and then determining whether or not a prize has been won by comparing this figure with prize combinations in the ROM.

After judgement for a normal game and judgement for a subsidiary game, if the CPU issues a drive signal to the hopper, the hopper is drive thereby to pay out tokens.

The game contents according to the aforementioned embodiment will now be described on the basis of Fig. 4.

With the power supply switched on, when a player inserts a token to the token input slot (9) and presses the start switch (10), the picture reels (1), (2), (3) start to rotate (101), and the game starts. Thereupon, when the player presses the respective stop buttons (11), (12), (13), as desired (102), the picture reels (1), (2), (3) stop at positions corresponding to the times at which the respective stop buttons were operated (103). At this time, prize winning is determined (104), and if no prize has been won, then the game ends directly.

In the embodiment shown in Fig. 4, prizes such as a continuation bonus and continuation bonus increase in a conventional game machine are removed, and when a particular prize is won, the machine proceeds to a subsidiary game, in which continuation bonus and continuation bonus increase prizes are won. When the aforementioned particular prize is won, the circular disk (81) starts to rotate (105), thereby starting a subsidiary game. In the present embodiment, the payout (100) of tokens corresponding to said particular prize is performed after the subsidiary game has

started, but of course, it may be performed before the subsidiary game starts, in other words, directly after the normal game has ended. When the player presses the stop button (14) (107), the circular disk (81) stops rotating. If the figure at which the disc has stopped is an even number, then a continuation bonus increase (large bonus) is determined by the microcomputer (30), and if it is an odd number, then a continuation bonus (small bonus) is determined, whereas if it is blank, then no prize is determined (108). If neither type of prize is won in the subsidiary game, then the game ends directly, but if a prize has been won, then the continuation bonus device or continuation bonus increasing device is activated, whereby a small bonus game (109) or large bonus game (110) can be played.

As described above, in the present embodiment, in addition to the normal game in step (101) to step (104), it is also possible to play a subsidiary game from step (105) to step (110), and therefore many extremely enjoyable games can be played on the machine.

Second Embodiment

This embodiment is described on the basis of Fig. 5. The portion relating to the normal game is the same as in the first embodiment, and is therefore not depicted in this diagram, and only the portion from step (104) in Fig. 4 onwards is depicted.

In this embodiment, the continuation bonus (small bonus) prize is left within the normal game, and only the continuation bonus increase (large bonus) prize is playable in the subsidiary game. In other words, the prize pictures for the continuation bonus increase are omitted from the picture reels (1), (2), (3).

In this embodiment, the circular disk (81) shown in Fig. 2d is appropriate. In this circular disk (81), an appropriate number of particular numerical figures, such as "7", are depicted in boxes demarcated along the circumference of the disc surface, and blank boxes are also provided thereon. If the disc stops with a box depicting a figure at the position of the stop mark (71), then a prize is won, and if it stops with a blank box at this position, then no prize is won. It is also possible to depict images, such as diamonds, or the like, instead of the aforementioned numerical figures. In the case of this disc, the probability of winning a prize in the subsidiary game is 50%.

At step (104), prize judgement for a normal game is carried out, and if a previously determined prize is won, then the circular disk (81) is rotated (105), thereby starting a subsidiary game, and simultaneously, tokens corresponding to the prize are paid out (106). When the player subsequently presses the stop button (14) (107), the

rotation of the circular disk (81) is halted and the microcomputer (30) determines the prize for the subsidiary game, from the combination of stopped figures (108). If, as a result of this judgement, a prize has been won, then a large bonus game can be played (109). If no prize has been won, then the game ends. If a continuation bonus prize is won in the judgement operation at step (104) for a normal game, then tokens corresponding to the prize are paid out (106), whereupon a small bonus game can be played (109).

Third embodiment

This embodiment is described on the basis of Fig. 6. The portion relating to the normal game is the same as in the first embodiment, and is therefore omitted from the diagram, which only depicts processing from step (104) in Fig. 4 onwards.

In the present embodiment, the continuation bonus increase (large bonus) prize is left within the normal game, and the continuation bonus (small bonus) prize only is played in the subsidiary game. In other words, the prize pictures for the continuation bonus are omitted from the picture reels (1), (2), (3). In the case of this embodiment, the circular disk (81) in Fig. 2d is appropriate, and the displayed symbols are desirably images, such as star symbols, for example. However, it is also possible to depict a particular numerical figure.

At step (104a), prize judgement is performed, and if a previously determined prize is won, then the circular disk (81) is rotated (105), thereby starting the subsidiary game, whilst simultaneously, tokens corresponding to the prize are paid out (106). Thereupon, when the player subsequently presses the stop button (14), the rotation of the circular disk (81) stops, and the microcomputer (30) performs prize judgement for the subsidiary game according to the combination of stopped figures (108). If, as a result of this judgement, a prize has been won, then a small bonus game can be played (110). If no prize has been won, then the game ends. If a continuation bonus increase prize was won in the judgement operation at step (104) for the normal game, then after tokens corresponding to the prize have been paid out (111), a large bonus game can be played (112).

Fourth embodiment

This embodiment is described on the basis of Fig. 7. In this embodiment, a reel (hereinafter called subsidiary reel (82)) is used as a rotating member for the subsidiary game means. The subsidiary reel (82) used is of virtually the same composition as the picture reels (1), (2), (3), but it may be formed to a smaller size than same. Symbols,

such as numerical figures, images, or the like, are depicted on the circumference surface thereof, in such a manner that a portion thereof is visible through the reel window (72).

In this embodiment, if a previously determined prize symbol stops at the position of the stop mark (73) provided to the side of the reel window (72), then it is judged that a prize has been won.

Fifth embodiment

In the respective embodiments described above, the halting of the issuing of the control signal to either the circular disk (81) or the subsidiary reel (82), or the like, is performed by one stop button (14) as illustrated in Fig. 1, but it is also possible for the halt signal to be issued automatically when a prescribed period of time (for example, 2 - 3 seconds) has elapsed, without providing any halt button.

Various embodiments of the present invention have been described above, but the present invention is not limited to these embodiments, and it is possible to adopt various modifications without departing from the essence of the invention.

(Merits of the Invention)

According to the present invention, if a prize is won in a normal game, then rather than simply obtaining a corresponding prize, it is also possible to play a subsidiary game as well, thereby providing a game which is interesting to play.

4. Detailed Description of the Drawings

Fig. 1 is a functional diagram of the present invention; Fig. 2a is front view of a front panel of a rotating drum type amusement machine relating to a first embodiment of the present invention; Figs. 2b - 2d are principal front views of a circular disc constituting a rotating member; Fig. 3 is an electrical circuit diagram of the first embodiment; Fig. 4 is a flowchart showing the game contents of the first embodiment; Fig. 5 is a flowchart showing the game contents of a second embodiment; Fig. 6 is a flowchart showing the game contents of a third embodiment; Fig. 7 is an explanatory diagram of a subsidiary reel forming a rotating member according to a fourth embodiment; Fig. 8 to Fig. 9 are explanatory diagrams of a conventional amusement machine; and Fig. 10 is a flowchart showing game contents according to the prior art.

(Principal symbols in the drawings)

(1), (2), (3) picture reel

(5), (6), (7)

(84) stepping motor

(10) start switch

(11), (12), (13), (14) stop button

(15), (16), (17), (87) position detecting sensor

(30) microcomputer

(31) normal game judging means

(32) subsidiary game judging means

(33) hopper driving means

(41) token detecting unit

(42) hopper

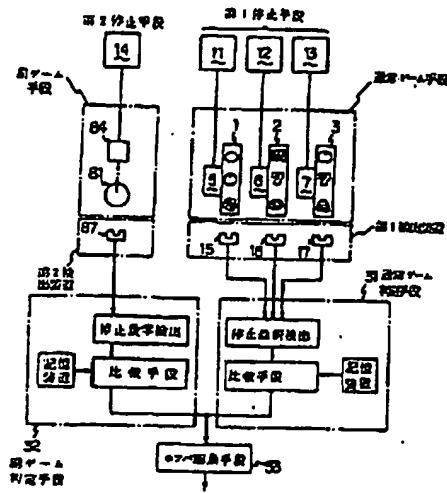
(81) circular disk

(82) subsidiary reel

Applicant Tokyo Pabuko K.K. (and one other)

Agent Sota Asahina (and one other)

Fig. 1



Key to figure, left to right, top to bottom:

Second stopping means

First stopping means

Subsidiary game means

Normal game means

First detecting device

Second detecting device

31 normal game judging means

Stopped figure detection

Stopped picture detection

Storage unit

Comparator means

Comparator means

Storage unit

32 Subsidiary game judging means

33 Hopper driving means

Fig. 2a

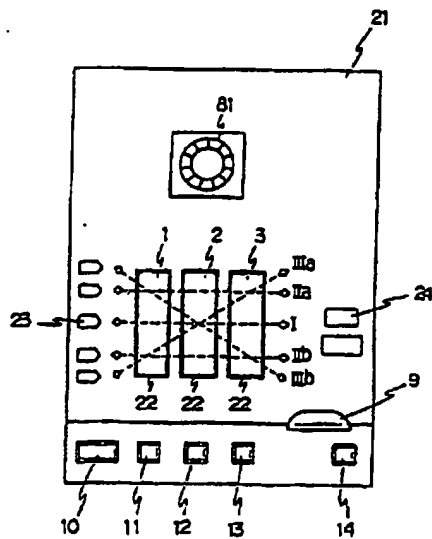


Fig. 2b

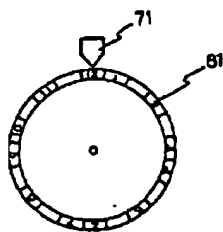


Fig. 2c

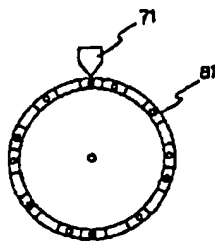


Fig. 2d

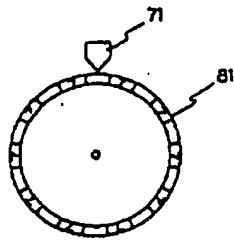
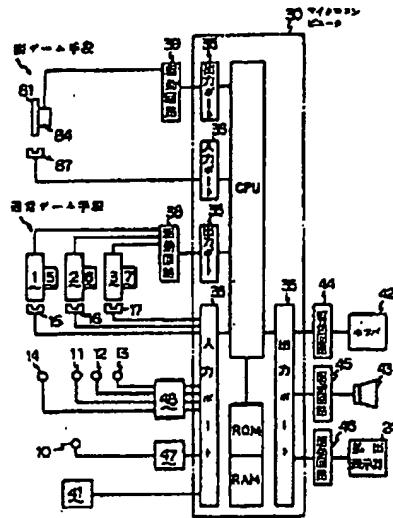


Fig. 3



Key to figure, left to right, top to bottom:

Subsidiary game means

39 Drive circuit

35 Output port

36 Input port

Normal game means

35 Output port

38 Drive circuit

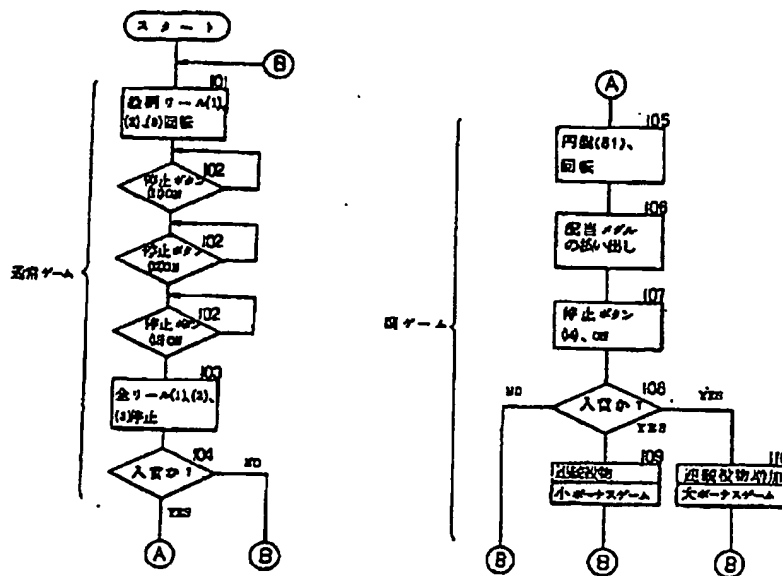
35 Output port

36 Input port

44 Drive circuit

45 Drive circuit
46 Drive circuit
42 Hopper
24 Payout display unit

Fig. 4



Key to figure, top to bottom, left to right:

START

101 Rotate picture reels (1), (2), (3)

102 Stop button (14) ON

102 Stop button (14) ON

Normal game

102 Stop button (14) ON

103 Stop all reels (1), (2), (3)

104 Prize won?

Right side:

105 Rotate circular disc (81)

106 Pay out corresponding tokens

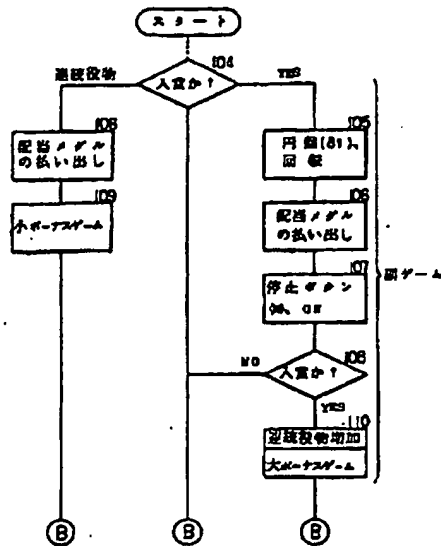
107 Stop button (14) ON

Subsidiary game

108 Prize won?

- 109 Continuation bonus
Small bonus game
- 110 Continuation bonus increase
Large bonus game

FIG. 5



Key to figure, left to right, top to bottom:

START

Continuation bonus

104 Prize?

106 Pay out corresponding tokens

105 Rotate circular disc (81)

109 Small bonus game

106 Pay out corresponding tokens

107 Stop button (14) ON

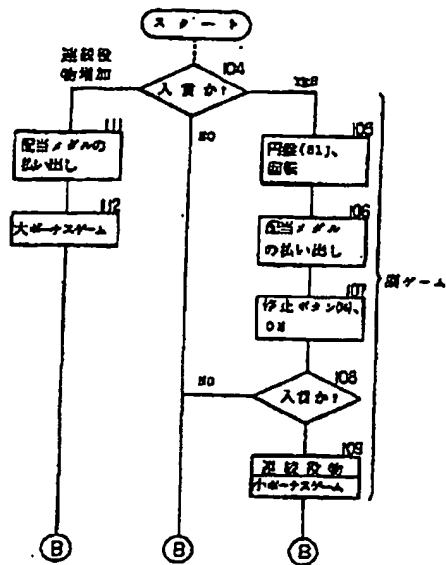
Subsidiary game

108 Prize won?

110 Increase continuation bonus

Large bonus game

Fig. 6



Key to figure, left to right, top to bottom:

START

Continuation bonus increase

104 Prize won?

111 Pay out corresponding tokens

105 Rotate circular disc (81)

112 Large bonus game

106 Pay out corresponding tokens

Subsidiary game

107 Stop button (14) ON

108 Prize won?

109 Continuation bonus

Small bonus game

Fig. 7

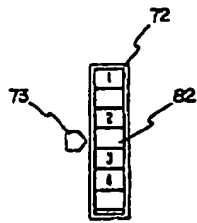


Fig. 8

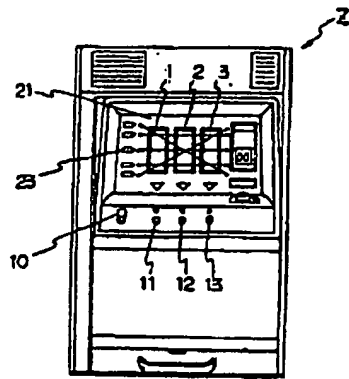


Fig. 9

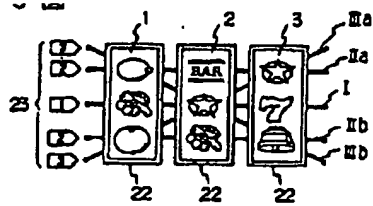
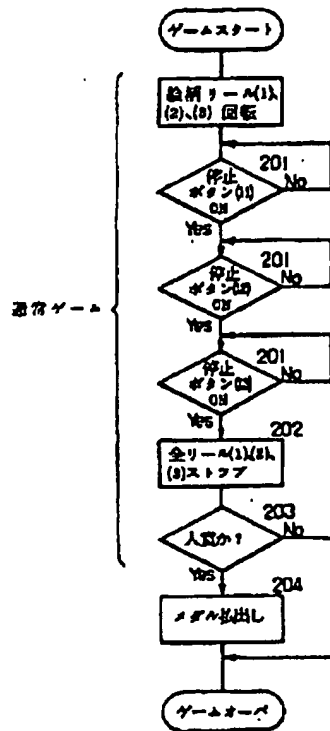


Fig. 10



Key to figure, top to bottom, left to right:

Game Start

Rotate picture reels (1), (2), (3)

201 Stop button (11) ON

201 Stop button (12) ON

Normal game

201 Stop button (13) ON

202 Stop all reels (1), (2), (3)

203 Prize won?

204 Pay out tokens

GAME OVER

Procedural Amendment

7th June 1986

Patent Governor's Office

1. Indication of case

Showa 61 Application No. 97650

2. Title of invention

Rotating drum type amusement machine

3. Party effecting amendment

Relationship to case Applicant

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and one other

5. Object of amendment

(1) "Detailed Description of the Invention" in Specification.

6. Details of amendment

(1) Page 14, line 8: "continuation bonus ..." amended to "continuation bonus increase ..."

END



TRANSLATION FROM JAPANESE

Japan Patent Office (JP) Patent Publication (A) Publication of Patent Application
62 - 254786
Published: 6th November 1987

(51) Int. Cl.	Identification symbol	Internal Ref. No.	FI	Technical designation
A 63 F9/00	102	B-8102-2C		

Examination: requested
No. of claims: 1 (Total : 11 pages)

(54) Title of the Invention:	Rotating drum type amusement machine
(21) Application No.:	S61-97650
(22) Application Date:	26 th April 1986

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SPECIFICATION

1. Title of the Invention

Rotating drum type amusement machine

2. Claims

1. A rotating drum type amusement machine comprising:

a) normal game means consisting of at least three picture reels having pictures of different types depicted on the circumferential faces thereof, and first driving devices, provided respectively for each of the picture reels, for causing said picture reels to rotate;

b) subsidiary game means consisting of a rotating member having a suitable number of differing symbols depicted on the surface thereof, and a second driving device for causing said rotating member to rotate;

- c) first stopping means for supplying stop signals individually to the respective first drive devices, in accordance with a deliberate operation;
- d) first detecting devices for detecting the stop positions of the respective reels when the rotation thereof is halted;
- e) normal game judging means for judging whether or not a prize has been won on the basis of the detection signals from the first detecting devices, and issuing a start signal for a subsidiary game in the case of a particular prize combination;
- f) second stopping means for supplying a stop signal to the second drive device;
- g) a second detecting device for detecting the stop position of the rotating member when the rotation thereof has halted;
- h) subsidiary game judging means for judging whether or not a prize has been won on the basis of the detection signal from the second detecting device; and
- i) hopper driving means for driving a hopper in such a manner that it pays out corresponding tokens, when a signal from said normal game judging means or a signal from said subsidiary game judging means is input thereto.

3. Detailed Description of the Invention

(Industrial Applicability)

The present invention relates to a rotating drum type amusement machine, as typified by a slot machine. More particularly, it relates to a rotating drum type amusement machine which can be played with greater interest.

(Prior Art)

A rotating drum type amusement machine, such as a slot machine, generally uses three picture reels provided with a cylindrical face depicting a plurality of pictures, these reels being caused to rotate and the respective picture reels then being stopped by a player pressing stop buttons provided for each reel, whereby the respective picture reels are caused to stop at random, and a prize is determined according to the combination of pictures in a previously determined the prize line, a prescribed number of tokens being paid out if the player has won a prize.

Figs. 8 to 9 show an approximate front view of a conventional rotating drum type amusement machine (Z) of this kind, and a prize line in a front panel (21) and picture reels, or the like, as viewed through a reel window.

The aforementioned rotating drum type amusement machine (Z) is also known as a "slot machine", and comprises a box-shaped housing, inside which are

accommodated three picture reels (1), (2), (3), motors for causing same to rotate, and other control devices and the like. 21 pictures of 7 different types, for example, are depicted in a random order on the respective outer circumferences of each of the aforementioned picture reels (1), (2), (3). Moreover, on the front panel (21) of the front upper portion of the machine, there are provided: a reel window (22) so that the player can see through to the pictures on the picture reels (1), (2), (3); a start switch (10) for causing the respective picture reels (1), (2), (3) to rotate; stop buttons (11), (12), (13) for stopping the rotation of the aforementioned picture reels (1), (2), (3), independently; a token input slot (9); a line display device (23) for displaying the positions and number of prize lines; and the like.

In this amusement machine (Z), five prize lines are provided corresponding to the three rows of picture reels (1), (2), (3) appearing in the reel window (22), and a prescribed position and number of prize lines can be selected mechanically from these five prize lines, by means of the number of tokens input. In other words, the machine is previously set up in such a manner that, if the number of tokens input by the player to the token input slot (9) is one token, then only the centre line (I) is selected, and in the case of two tokens, the lines above and below the centre line (I), namely (IIa), (IIb), are added to provide three prize lines, whilst if three tokens are input, then the diagonal lines (IIIa), (IIIb) are also added to provide five prize lines.

The game in this conventional amusement machine (Z) consists of one, three or five prize lines being selected according to the number of tokens input by the player to the token input slot (9), whereupon the line display device (23) indicating the prize lines lights up to inform the players the number and positions of the prize lines. The player then presses the start switch (10), causing the respective picture reels (1), (2), (3) to rotate, and thereby starting the game. Thereupon, as illustrated in Fig. 10, when the player presses the stop buttons (11), (12), (13), respectively, in a desired sequence (201), the picture reels (1), (2), (3) stop rotating, and when all of the picture reels (1), (2), (3) have stopped (202), a prize is determined according to the combination of pictures which have stopped on the aforementioned prize lines (203). If a prize has been won, then a prescribed number of tokens are paid out (204) (hereinafter, this game is called "normal game").

The rotational speed of the respective picture reels (1), (2), (3) described above is a speed whereby the pictures on the outer circumferences are difficult to discern clearly, and in most cases, the player simply presses the stop buttons (11), (12), (13), at

random, but to some extent, he or she is able to stop the picture reels (1), (2), (3) at desired stop positions, in a deliberate manner. Therefore, a rotating drum type amusement machine (Z) of this kind stimulates the interest of the player, sufficiently, and allows him or her to play an interesting game.

In a conventional amusement machine (Z) of this kind, in order to further increase the interest generated by the game, it has also become possible to play a continuation bonus game using one picture reel only, in addition to the aforementioned normal game. A continuation bonus game is also known generally as a small bonus game, wherein, after the picture reels have rotated and each picture reel has been stopped, one at a time, if any one of the picture reels has stopped at a picture indicating a continuation bonus, then a prescribed number of tokens are paid out.

A continuation bonus game can be achieved by operating a built-in continuation bonus device, if a prescribed prize combination is obtained in the prize combinations of the normal game. Moreover, it is also possible to adopt a composition comprising a continuation bonus increasing device which allows large bonus games to be played by increasing the number of games of the continuation bonus game itself, thereby further enhancing the player's interest in the game.

(Problems to be Solved by the Invention)

The conventional amusement machine (Z) described above is widely used to play very entertaining games wherein the stopping position of the picture reels are determined by a combination of an element of chance and an element of the player's skill in pressing the stop buttons in a deliberate fashion.

As a result of continued and thorough research into amusement machines which might enable more interesting games to be played, the present inventor discovered that a more interesting game might be possible if a chance for playing a small bonus game or large bonus game (hereinafter, called "subsidiary game") could be imparted by some means other than the picture reels, when a particular prize combination is obtained in a normal game.

The present invention provides a new rotating drum type amusement machine completed on the basis of this finding.

(Means for Solving the Problems)

The rotating drum type amusement machine according to the present invention is now described on the basis of Fig. 1.

The present invention is characterized in that it comprises: (a) normal game means consisting of at least three picture reels (1), (2), (3) having pictures of different types depicted on the circumferential faces thereof, and first driving devices (5), (6), (7), provided respectively for each of the picture reels (1), (2), (3), for causing said picture reels (1), (2), (3) to rotate; (b) subsidiary game means consisting of a rotating member (81) having a suitable number of differing symbols depicted on the surface thereof, and a second driving device (84) for causing said rotating member (81) to rotate; (c) first stopping means (11), (12), (13) for supplying stop signals individually to the respective first drive devices (5), (6), (7), in accordance with a deliberate operation; (d) first detecting devices (15), (16), (17) for detecting the stop positions of the respective reels (1), (2), (3) when the rotation thereof is halted; (e) normal game judging means for judging whether or not a prize has been won on the basis of the detection signals from the first detecting devices (15), (16), (17), and issuing a start signal for a subsidiary game in the case of a particular prize combination; (f) second stopping means (14) for supplying a stop signal to the second drive device (84); (g) a second detecting device (87) for detecting the stop position of the rotating member (81) when the rotation thereof has halted; (h) subsidiary game judging means (32) for judging whether or not a prize has been won on the basis of the detection signal from the second detecting device (87); and (i) hopper driving means (33) for driving a hopper in such a manner that it pays out corresponding tokens, when a signal from said normal game judging means (31) or a signal from said subsidiary game judging means (32) is input thereto.

The aforementioned rotating member (81) may be of any form, provided that symbols, such as numerical figures, images, or the like, are depicted on the surface thereof, and for example, a circular disc having numerical figures or images depicted on a circumferential fashion on the surface of the disc, or a reel having numerical figures or images depicted on the outer circumference thereof, may be used. The aforementioned second stopping means (14) may also be operated by deliberate human operation, or it may be operated automatically.

(Action)

In the present invention, three picture reels (1), (2), (3) are caused to rotated by first drive devices (5), (6), (7). When first stopping means (11), (12), (13) are operated intentionally after the reels have started to rotate, then the three picture reels (1), (2), (3) are stopped at rotational positions corresponding to the times at which they were

operated. The rotational stopping positions of the respective picture reels (1), (2), (3) when they are halted are detected respectively by first detecting devices (15), (16), (17).

In this way, when one round of a normal game ends, it is determined by normal game determining means (31) whether or not the stopped pictures of the respective picture reels (1), (2), (3) form a combination corresponding to a prize, on the basis of the stop signals from the first detecting devices (15), (16), (17), and if a prize has been won, then a start signal for a subsidiary game is issued.

The subsidiary game begins with a rotating member (81) starting to rotate in accordance with said start signal. The rotation of the rotating member (81) is halted by operation of second stopping means (14), and subsidiary game determining means (32) then determines whether or not the symbols displayed when it stops form a combination corresponding to a prize. If a standard prize was obtained in the normal game, then at this point, hopper driving means (33) operates and pays out corresponding tokens, and one round of the game finishes without proceeding to the subsidiary game. If a particular prize is obtained in the normal game, then the tokens corresponding to the normal game are paid out, and the machine then also transfers to the subsidiary game. If a prize is won in the subsidiary game, then at that point, the continuation bonus device or continuation bonus increasing device is activated, and a small bonus game or large bonus game can be played. Moreover, if no prize is won during the normal game, then one round of the game ends without any tokens being paid out, and if no prize is won in the subsidiary game, then the game ends directly, and the machine returns to its original state.

(Embodiments)

Next, embodiments of the present invention will be described.

Fig. 1 is a functional diagram of the present invention; Fig. 2a shows a front panel of a rotating drum type amusement machine relating to a first embodiment of the present invention; Fig. 2b - 2d shows principal front views of circular discs forming rotating members; Fig. 3 is an electrical circuit diagram of the first embodiment; Fig. 4 is a flow chart showing the game contents of the first embodiment; Fig. 5 is a flowchart showing the game contents of a second embodiment; Fig. 6 is a flowchart showing the game contents of a third embodiment; and Fig. 7 is an explanatory diagram of a subsidiary reel forming a rotating member according to a fourth embodiment.

In Fig. 2a, (21) is a front panel of a slot machine relating to the present embodiments. Three reel windows (22) are provided in the centre of said front panel

(21), through which three lines of pictures on picture reels (1), (2), (3) for a normal game can be viewed. The picture reels (1), (2), (3) have, for example, 21 pictures of 7 different types depicted on the outer circumferences thereof, within boxes provided at equal pitch. These picture reels (1), (2), (3) are supported by an installation frame on the inside of the main unit, and stepping motors (5), (6), (7) constituting first driving devices are connected respectively to the rotational shafts thereof. Control type motors, such as DC motors or AC motors, may be used as the aforementioned first driving devices. (I), (IIa), (IIb), (IIIa), (IIIb) are respective prize lines, and lines indicating these prize lines are depicted on the reel windows (22).

A circular disc (81) forming a rotating member for a subsidiary game is provided on the upper portion of the front panel (21). This circular disc (81) is supported on an installation frame inside the main unit, and the rotational shaft thereof is connected to a stepping motor (84) constituting a second driving device. A control type motor, such as a DC motor or AC motor, may be used for said second driving device.

As illustrated in Fig. 2b, said circular disc (81) shows figures from 1 to 12 within boxes demarcated in circumferential fashion on the disc, on which blank boxes are also provided. Moreover, as shown in Fig. 2c, a disc depicting single circles or double-circles instead of the aforementioned figures, or a disc depicting pictures, such as diamond or star shapes, or the like, instead of these circle symbols, may also be used.

A stopping mark (71) indicating one figures or picture is provided above the circular disk (81). The probability of winning a prize in the subsidiary game is set by a ratio of the prize symbols compared to the total number of boxes, and therefore, the number of prize symbols should be determined in accordance with the desired prize probability. For example, in the case of the circular disk (81) in Fig. 2b, the odd numbers (6 boxes) are allocated to continuation bonus prizes, the even numbers (6 boxes) are allocated to continuation bonus increase prizes, and the blank boxes (8 boxes) are allocated to no prize. Moreover, in the case of the circular disk (81) in Fig. 2c, the single circle symbols or star symbols (6 boxes) are allocated to continuation bonus prizes, the double circle symbols or diamond symbols (6 boxes) are allocated to continuation bonus prizes [*sic*], and the blank boxes (8 boxes) are allocated to no prize.

The following description relates to a case where a circular disk (81) as shown in Fig. 2b is used, but the case of a circular disk (81) as shown in Fig. 2c should also be understood similarly.

In addition to the foregoing, there are also provided on the front panel (21): a payment display device (24) for displaying the amount of tokens to be paid out when a prize is won; a token input slot (9) for inserting a prescribed number of tokens for each game; a start switch (10) for activating the respective picture reels; stop buttons (11), (12), (13) provided corresponding to each of the picture reels (1), (2), (3), for stopping the respective picture reels (1), (2), (3); a stop button (14) for stopping the aforementioned circular disk (81); and the like.

Next, an electrical circuit is described on the basis of Fig. 3. (30) is a microcomputer for controlling the entire slot machine. This microcomputer (30) performs the necessary comparisons and judgements required in implementing the game, on the basis of input signals, and it comprises: a CPU for outputting these results as control signals; a ROM for storing procedures for making comparisons and judgements in the CPU, programs for determining the order in which such steps are implemented; and combination data, and the like, for the prize-winning stop pictures and the prize-winning stop figure required to determine prize winning in a normal game and a subsidiary game; a RAM for storing other data; and an input port (36) for selecting the timing combination of external signals and internal signals, and input/output signals, and an output port (35) for outputting control signals (35).

The stepping motors (5), (6), (7) are connected via a drive circuit (38) to the output port (35), in such a manner that whilst a pulse-shaped control signal is supplied from the CPU, a drive signal is transmitted by the drive circuit (38), thereby causing the stepping motors (5), (6), (7) to rotate.

The start switch (10), respective stop buttons (11), (12), (13), (14), respective detection sensors (15), (16), (17), and the token output device (41) are connected respectively to the input port (36). An start up circuit (47) and stopping circuit (48) are interposed respectively in the signal line from the aforementioned start switch (10) and the signal line from the respective stop buttons (11), (12), (13), (14). Said position detecting sensors (15), (16), (17) detect a reset signal section provided at one point on the circumference of each of the picture reels (1), (2), (3), and are constituted by photosensors, for example, in such a manner that they issue a reset signal once for each revolution of the picture reels (1), (2), (3).

Said token detecting section (41) detects the fact that tokens have been input to the token input slot (9), and the number of tokens thus input, and a micro-switch, photosensor, or the like, may be used for same.

Moreover, a stepping motor (84) for causing the circular disk (81) to rotate is connected between the output port (35) and input port (36). This stepping motor (84) receives a drive signal from the drive circuit (39), whilst a control signal is issued by the CPU, whereby it is caused to rotate. When the stop button (14) is pressed, the drive signal from the CPU is halted, and the rotation of the stepping motor (84) stops. A position detecting sensor (87) detects a reset signal provided at one point on the circumference of the circular disk (81), and is constituted by a photosensor, for example, in such a manner that it issues one reset signal for each revolution of the circular disk (81).

The output port (35) is connected, via respective drive circuits (44), (45), (46), to: a hopper (42) for paying out corresponding tokens when a prize has been won; a speaker (43) for playing different tuneful melodies when different prizes are won; and a payout display unit (24) for displaying the number of tokens corresponding to the prize (for example, 2, 5, 8, 10 or 15 tokens).

In this embodiment, when a player inputs a token to the token input slot (9) with the power supply switched on, a detection signal for same is sent to the CPU by the token detecting unit (41), and the CPU sets the slot machine to an active state, whilst also issuing a drive signal to the speaker (43) in such a manner that a previously determined melody is played.

In this state, if the player then presses the start switch (10), then a start signal is fed to the CPU, which in turn issues drive signals simultaneously to the stepping motors (5), (6), (7), whereby the picture reels (1), (2), (3) all start to rotate. Thereupon, if the player presses one of the stop buttons (11), (12), (13), a stop signal is fed to the CPU, and immediately, the drive signal from the CPU is halted and the rotation of the picture reels (1), (2), (3) is halted. The stepping motors (5), (6), (7) rotate precisely in reaction to the drive signals, and when the player performs a push button operation, they halt almost instantaneously. Therefore, the player is able to freely select the order and time intervals by which he or she presses the stop buttons (11), (12), (13), so as to halt the respective picture reels (1), (2), (3) in desired positions.

Normal game determining means (31) and subsidiary game determining means (32) are achieved by software processing in the microcomputer (30).

Judgement of prizes in a normal game is performed in the following manner. The CPU counts the number of pulses of the drive signal from the time at which the last reset signal was input, of the reset signals input at each revolution of the picture reels

(1), (2), (3) from the position detecting sensors (15), (16), (17), to the time at which the stop signal is input and the transmission of the drive signal to the stepping motors (5), (6), (7) is halted. Since the number of pulses of the drive signal required to rotate one picture box section depicted on the picture reels (1), (2), (3) is already known, it can be judged which boxes of each picture reel (1), (2), (3) appear in the reel window (22), according to the counted number of pulses. In order to judge prize winning, the combinations of different types of pictures which relate to prize winning are stored in a prescribed area of the ROM. The CPU takes the number of counted pulses as an instance, and compares this with the information in the ROM. If the compared information matches, then a prize has been won, and the type of prize is also determined.

Judgement of prize winning in a subsidiary game is performed by means of the CPU detecting the stopped figure on the circular disk (81), on the basis of the reset signal from the position detecting sensor (87), similarly to the case of the picture reels (1), (2), (3) described above, and then determining whether or not a prize has been won by comparing this figure with prize combinations in the ROM.

After judgement for a normal game and judgement for a subsidiary game, if the CPU issues a drive signal to the hopper, the hopper is drive thereby to pay out tokens.

The game contents according to the aforementioned embodiment will now be described on the basis of Fig. 4.

With the power supply switched on, when a player inserts a token to the token input slot (9) and presses the start switch (10), the picture reels (1), (2), (3) start to rotate (101), and the game starts. Thereupon, when the player presses the respective stop buttons (11), (12), (13), as desired (102), the picture reels (1), (2), (3) stop at positions corresponding to the times at which the respective stop buttons were operated (103). At this time, prize winning is determined (104), and if no prize has been won, then the game ends directly.

In the embodiment shown in Fig. 4, prizes such as a continuation bonus and continuation bonus increase in a conventional game machine are removed, and when a particular prize is won, the machine proceeds to a subsidiary game, in which continuation bonus and continuation bonus increase prizes are won. When the aforementioned particular prize is won, the circular disk (81) starts to rotate (105), thereby starting a subsidiary game. In the present embodiment, the payout (100) of tokens corresponding to said particular prize is performed after the subsidiary game has

started, but of course, it may be performed before the subsidiary game starts, in other words, directly after the normal game has ended. When the player presses the stop button (14) (107), the circular disk (81) stops rotating. If the figure at which the disc has stopped is an even number, then a continuation bonus increase (large bonus) is determined by the microcomputer (30), and if it is an odd number, then a continuation bonus (small bonus) is determined, whereas if it is blank, then no prize is determined (108). If neither type of prize is won in the subsidiary game, then the game ends directly, but if a prize has been won, then the continuation bonus device or continuation bonus increasing device is activated, whereby a small bonus game (109) or large bonus game (110) can be played.

As described above, in the present embodiment, in addition to the normal game in step (101) to step (104), it is also possible to play a subsidiary game from step (105) to step (110), and therefore many extremely enjoyable games can be played on the machine.

Second Embodiment

This embodiment is described on the basis of Fig. 5. The portion relating to the normal game is the same as in the first embodiment, and is therefore not depicted in this diagram, and only the portion from step (104) in Fig. 4 onwards is depicted.

In this embodiment, the continuation bonus (small bonus) prize is left within the normal game, and only the continuation bonus increase (large bonus) prize is playable in the subsidiary game. In other words, the prize pictures for the continuation bonus increase are omitted from the picture reels (1), (2), (3).

In this embodiment, the circular disk (81) shown in Fig. 2d is appropriate. In this circular disk (81), an appropriate number of particular numerical figures, such as "7", are depicted in boxes demarcated along the circumference of the disc surface, and blank boxes are also provided thereon. If the disc stops with a box depicting a figure at the position of the stop mark (71), then a prize is won, and if it stops with a blank box at this position, then no prize is won. It is also possible to depict images, such as diamonds, or the like, instead of the aforementioned numerical figures. In the case of this disc, the probability of winning a prize in the subsidiary game is 50%.

At step (104), prize judgement for a normal game is carried out, and if a previously determined prize is won, then the circular disk (81) is rotated (105), thereby starting a subsidiary game, and simultaneously, tokens corresponding to the prize are paid out (106). When the player subsequently presses the stop button (14) (107), the

rotation of the circular disk (81) is halted and the microcomputer (30) determines the prize for the subsidiary game, from the combination of stopped figures (108). If, as a result of this judgement, a prize has been won, then a large bonus game can be played (109). If no prize has been won, then the game ends. If a continuation bonus prize is won in the judgement operation at step (104) for a normal game, then tokens corresponding to the prize are paid out (106), whereupon a small bonus game can be played (109).

Third embodiment

This embodiment is described on the basis of Fig. 6. The portion relating to the normal game is the same as in the first embodiment, and is therefore omitted from the diagram, which only depicts processing from step (104) in Fig. 4 onwards.

In the present embodiment, the continuation bonus increase (large bonus) prize is left within the normal game, and the continuation bonus (small bonus) prize only is played in the subsidiary game. In other words, the prize pictures for the continuation bonus are omitted from the picture reels (1), (2), (3). In the case of this embodiment, the circular disk (81) in Fig. 2d is appropriate, and the displayed symbols are desirably images, such as star symbols, for example. However, it is also possible to depict a particular numerical figure.

At step (104a), prize judgement is performed, and if a previously determined prize is won, then the circular disk (81) is rotated (105), thereby starting the subsidiary game, whilst simultaneously, tokens corresponding to the prize are paid out (106). Thereupon, when the player subsequently presses the stop button (14), the rotation of the circular disk (81) stops, and the microcomputer (30) performs prize judgement for the subsidiary game according to the combination of stopped figures (108). If, as a result of this judgement, a prize has been won, then a small bonus game can be played (110). If no prize has been won, then the game ends. If a continuation bonus increase prize was won in the judgement operation at step (104) for the normal game, then after tokens corresponding to the prize have been paid out (111), a large bonus game can be played (112).

Fourth embodiment

This embodiment is described on the basis of Fig. 7. In this embodiment, a reel (hereinafter called subsidiary reel (82)) is used as a rotating member for the subsidiary game means. The subsidiary reel (82) used is of virtually the same composition as the picture reels (1), (2), (3), but it may be formed to a smaller size than same. Symbols,

such as numerical figures, images, or the like, are depicted on the circumference surface thereof, in such a manner that a portion thereof is visible through the reel window (72).

In this embodiment, if a previously determined prize symbol stops at the position of the stop mark (73) provided to the side of the reel window (72), then it is judged that a prize has been won.

Fifth embodiment

In the respective embodiments described above, the halting of the issuing of the control signal to either the circular disk (81) or the subsidiary reel (82), or the like, is performed by one stop button (14) as illustrated in Fig. 1, but it is also possible for the halt signal to be issued automatically when a prescribed period of time (for example, 2 - 3 seconds) has elapsed, without providing any halt button.

Various embodiments of the present invention have been described above, but the present invention is not limited to these embodiments, and it is possible to adopt various modifications without departing from the essence of the invention.

(Merits of the Invention)

According to the present invention, if a prize is won in a normal game, then rather than simply obtaining a corresponding prize, it is also possible to play a subsidiary game as well, thereby providing a game which is interesting to play.

4. Detailed Description of the Drawings

Fig. 1 is a functional diagram of the present invention; Fig. 2a is front view of a front panel of a rotating drum type amusement machine relating to a first embodiment of the present invention; Figs. 2b - 2d are principal front views of a circular disc constituting a rotating member; Fig. 3 is an electrical circuit diagram of the first embodiment; Fig. 4 is a flowchart showing the game contents of the first embodiment; Fig. 5 is a flowchart showing the game contents of a second embodiment; Fig. 6 is a flowchart showing the game contents of a third embodiment; Fig. 7 is an explanatory diagram of a subsidiary reel forming a rotating member according to a fourth embodiment; Fig. 8 to Fig. 9 are explanatory diagrams of a conventional amusement machine; and Fig. 10 is a flowchart showing game contents according to the prior art.

(Principal symbols in the drawings)

(1), (2), (3) picture reel

(5), (6), (7)

(84) stepping motor

(10) start switch

(11), (12), (13), (14) stop button

(15), (16), (17), (87) position detecting sensor

(30) microcomputer

(31) normal game judging means

(32) subsidiary game judging means

(33) hopper driving means

(41) token detecting unit

(42) hopper

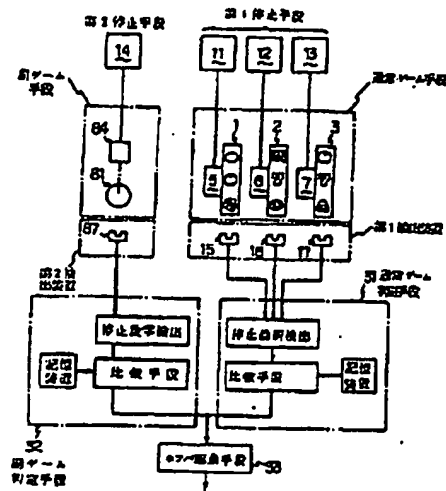
(81) circular disk

(82) subsidiary reel

Applicant Tokyo Pabuko K.K. (and one other)

Agent Sota Asahina (and one other)

Fig. 1



Key to figure, left to right, top to bottom:

Second stopping means

First stopping means

Subsidiary game means

Normal game means

First detecting device

Second detecting device

31 normal game judging means

Stopped figure detection

Stopped picture detection

Storage unit

Comparator means

Comparator means

Storage unit

32 Subsidiary game judging means

33 Hopper driving means

Fig. 2a

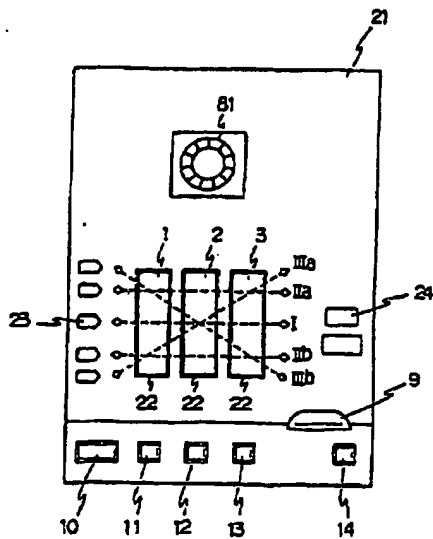


Fig. 2b

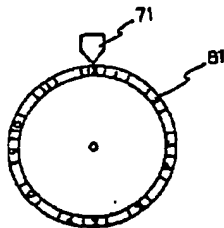


Fig. 2c

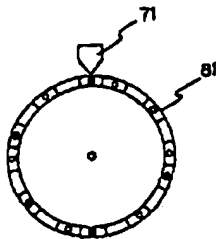


Fig. 2d

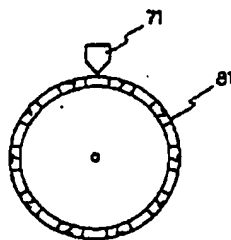
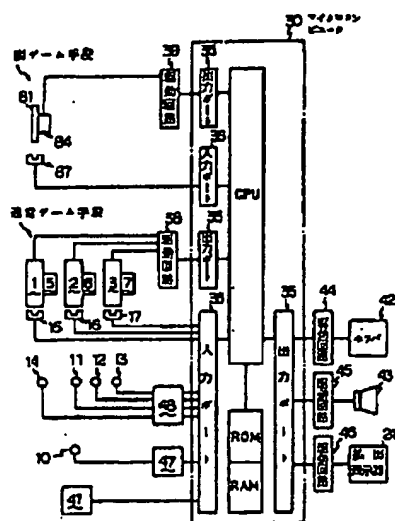


Fig. 3



Key to figure, left to right, top to bottom:

Subsidiary game means

39 Drive circuit

35 Output port

36 Input port

Normal game means

35 Output port

38 Drive circuit

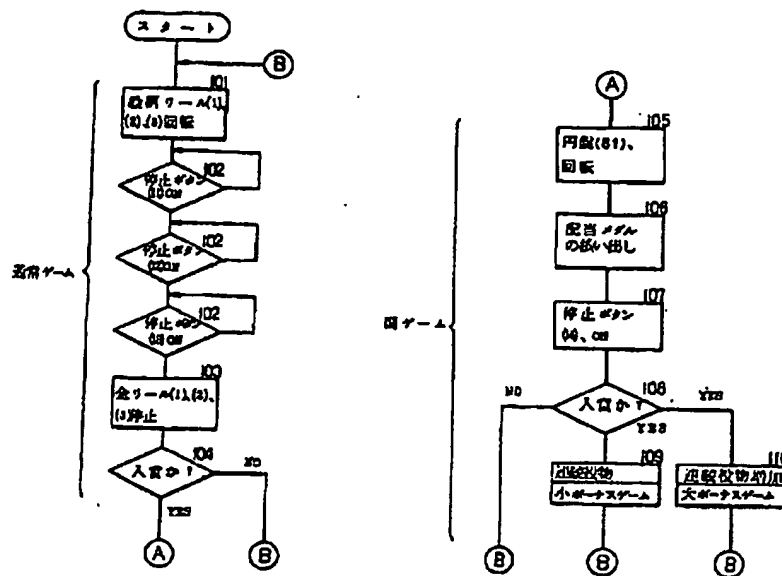
35 Output port

36 Input port

44 Drive circuit

45 Drive circuit
46 Drive circuit
42 Hopper
24 Payout display unit

Fig. 4



Key to figure, top to bottom, left to right:

START

101 Rotate picture reels (1), (2), (3)

102 Stop button (14) ON

102 Stop button (14) ON

Normal game

102 Stop button (14) ON

103 Stop all reels (1), (2), (3)

104 Prize won?

Right side:

105 Rotate circular disc (81)

106 Pay out corresponding tokens

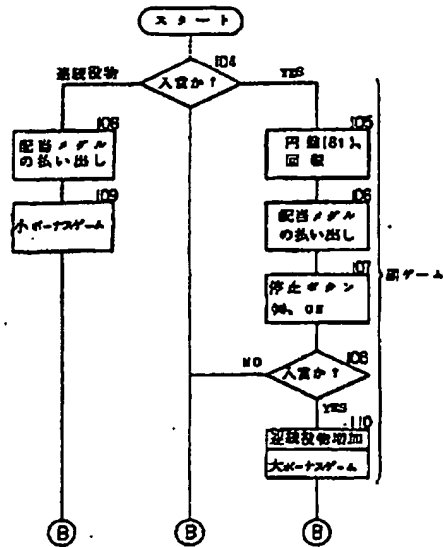
107 Stop button (14) ON

Subsidiary game

108 Prize won?

- 109 Continuation bonus
Small bonus game
- 110 Continuation bonus increase
Large bonus game

FIG. 5



Key to figure, left to right, top to bottom:

START

Continuation bonus

104 Prize?

106 Pay out corresponding tokens

105 Rotate circular disc (81)

109 Small bonus game

106 Pay out corresponding tokens

107 Stop button (14) ON

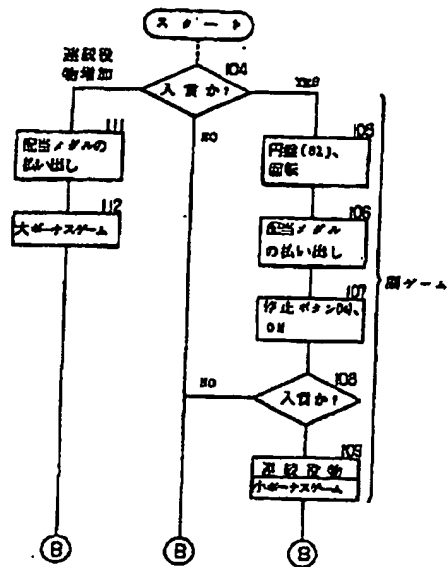
Subsidiary game

108 Prize won?

110 Increase continuation bonus

Large bonus game

Fig. 6



Key to figure, left to right, top to bottom:

START

Continuation bonus increase

104 Prize won?

111 Pay out corresponding tokens

105 Rotate circular disc (81)

112 Large bonus game

106 Pay out corresponding tokens

Subsidiary game

107 Stop button (14) ON

108 Prize won?

109 Continuation bonus

Small bonus game

Fig. 7

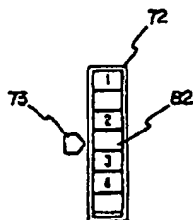


Fig. 8

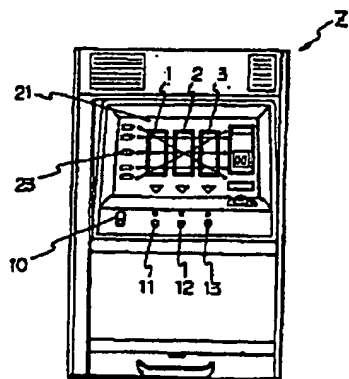


Fig. 9

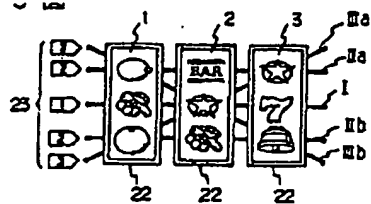
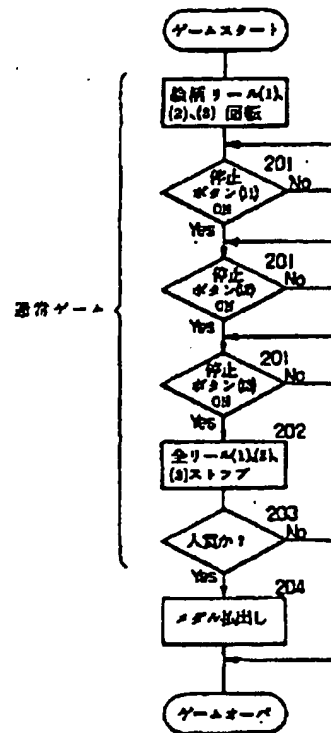


Fig. 10



Key to figure, top to bottom, left to right:

Game Start

Rotate picture reels (1), (2), (3)

201 Stop button (11) ON

201 Stop button (12) ON

Normal game

201 Stop button (13) ON

202 Stop all reels (1), (2), (3)

203 Prize won?

204 Pay out tokens

GAME OVER

Procedural Amendment

7th June 1986

Patent Governor's Office

1. Indication of case

Showa 61 Application No. 97650

2. Title of invention

Rotating drum type amusement machine

3. Party effecting amendment

Relationship to case Applicant

Address

Name Tokyo Pabuko K.K.

and one other

4. Agent T540 .

Address

Name (6522) Sota Asahina Patent Attorney

Tel : (06) 943-8922

and one other

5. Object of amendment

(1) "Detailed Description of the Invention" in Specification.

6. Details of amendment

(1) Page 14, line 8: "continuation bonus ..." amended to "continuation bonus increase ..."

END

⑨ 日本国特許庁(JP)

⑩ 特許出願公開

⑫ 公開特許公報(A)

昭62-254786

⑮ Int.Cl.⁴

識別記号

庁内整理番号

⑬ 公開 昭和62年(1987)11月6日

A 63 F 9/00

1 0 2

B-8102-2C

審査請求 有 発明の数 1 (全11頁)

⑭ 発明の名称 回胴式遊戯機

⑯ 特 願 昭61-97650

⑰ 出 願 昭61(1986)4月26日

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明 細 書

1 発明の名称

回胴式遊戯機

2 特許請求の範囲

- 1 (a) 円周面に異種の絵柄が通数個表示された、少なくとも3本の絵柄リールと、その絵柄リールを回転させるため、各絵柄リールのそれぞれに設けられた第1駆動装置からなる通常ゲーム手段と、
- (b) 表面に異なる記号が通数個表示された回転体と、その回転体を回転させるための第2駆動装置とからなる副ゲーム手段と、
- (c) 第1駆動装置のそれぞれに人為的操作により個別に停止信号を与える第1停止手段と、
- (d) 回転を停止したときの各絵柄リールの停止位置を検出する第1検出装置と、
- (e) 第1検出装置の検知信号に基づき、入賞が否かを判定するとともに、特定の入賞組合せ

のとき副ゲームの開始信号を発する通常ゲーム判定手段と、

(f) 第2駆動装置に停止信号を与える第2停止手段と、

(g) 回転を停止したときの回転体の停止位置を検出する第2検出装置と、

(h) 第2検出装置の検知信号に基づき入賞が否かを判定する副ゲーム判定手段と、

(i) 前記通常ゲーム判定手段の信号または前記副ゲーム判定手段の信号が入力したときに、配当メダルを払い出すべくホッパを駆動するホッパ駆動手段

とを備える回胴式遊戯機。

3 発明の詳細な説明

〔産業上の利用分野〕

本発明はスロットマシンに代表される回胴式遊戯機に関する。さらに詳しくは、より面白く遊べる回胴式遊戯機に関する。

〔従来の技術〕

スロットマシンなどの回胴式遊戯機は、通常多数の絵柄が円周面に設けられている絵柄リールを3本用い、それらを回転させ、各絵柄リールに1個ずつ設けられている停止ボタンを遊戯者が押すことにより、各絵柄リールをランダムに停止させ、あらかじめ定められている入賞ラインにおける絵柄の組合せに応じて入賞を判定し、入賞したばあいには所定枚数のメダルを払出す遊戯機である。

第1～9図には、そのような従来の回胴式遊戯機(2)の概略正面図および正面パネル図上における入賞ラインとリール窓からみた絵柄リールなどが示されている。

前記回胴式遊戯機(2)は、いわゆるスロットマシンとも呼ばれるもので、ボックス状のハウジングを有しており、その内部には3本の絵柄リール(1)、(2)、(3)やそれらを回転させるためのモータその他の制御機器などが内蔵されている。なお前記各絵柄リール(1)、(2)、(3)の外周面のそれぞれには、たとえば7種類21個の絵柄がラン

ダムな配列順序で表示されている。また前面上部の正面パネル図には、絵柄リール(1)、(2)、(3)の絵柄を遊戯者が見通すためのリール窓(4)、各絵柄リール(1)、(2)、(3)を回転させるためのスタートスイッチ(5)、前記各絵柄リール(1)、(2)、(3)の回転を個別に停止させるための停止ボタン(6)、(7)、(8)、メダル投入口(9)および入賞ラインの位置と本数を表示するためのライン表示器(10)などが設けられている。

かかる遊戯機(2)では、入賞ラインはリール窓(4)に現われる各絵柄リール(1)、(2)、(3)の3列の絵柄に対応して5本用意されており、それらの中から所定の位置と本数の入賞ラインがメダル投入枚数によって機械的に選択されるようになっている。すなわち遊戯者がメダル投入口(9)に入れたメダルの枚数が1枚のばあいには中央ライン(Ⅰ)のろが、2枚のばあいには中央ライン(Ⅰ)に上下のライン(Ⅱa)、(Ⅱb)が加えられた3本のラインが、3枚のばあいにはさらに斜めのライン(Ⅲa)、(Ⅲb)が加えられた5本のラインが、

それぞれ入賞ラインとなるようにあらかじめ設定されている。

そのような従来の遊戯機(2)におけるゲームは、遊戯者がメダル投入口(9)に投入したメダルの枚数に応じて1本、3本または5本の入賞ラインが選択され、さらにそれを指示するライン表示器(10)が点灯し、遊戯者に入賞ラインの位置と本数が知らされる。そして遊戯者がスタートスイッチ(5)を押して、各絵柄リール(1)、(2)、(3)を回転させるとゲームがスタートする。そののちは第10図に示されるように、停止ボタン(6)、(7)、(8)をそれぞれ任意の順序で押すと(201)、各絵柄リール(1)、(2)、(3)が回転を停止し、全ての絵柄リール(1)、(2)、(3)が停止したとき(202)、前記入賞ラインにおける停止絵柄の組合せで入賞が判定される(203)。そして入賞のばあいには所定枚数のメダルが払い出される(204)（以下、このゲームを通常ゲームという）。

ところで前記の各絵柄リール(1)、(2)、(3)の回転速度は、外周面の絵柄が明瞭には判読しにく

い程度の速さであり、たいていのばあい遊戯者は停止ボタン(6)、(7)、(8)をランダムに押すしかないが、ある程度は狙いをつけて思い通りの停止位置に絵柄リール(1)、(2)、(3)を停止させることができる。そのためこのような回胴式遊戯機(2)は、適度に遊戯者の興味心を刺激し、面白いゲームができる遊戯機となっている。

なおかかる従来の遊戯機(2)において、ゲームの面白さを一層倍加するために、前記通常ゲームのほか、1本の絵柄リールで行なう連続役物ゲームができるようになっている。連続役物ゲームとは一般に小ボーナスゲームとも称されるものであり、絵柄リールを回転させたのち絵柄リールを1本ずつ停止させ、1本の絵柄リールが連続役物を指定する絵柄で停止すれば所定枚数のメダルが払い出されるというゲームである。

かかる連続役物ゲームは、通常ゲームの入賞組合せのうち特定の入賞組合せになると内蔵する連続役物装置が作動して行なうことができる

ようになっている。さらに連続役物ゲーム自体のゲーム回数を増加するいわゆる大ボーナスゲームをできるようにした連続役物増加装置を設けたものもあり、一層ゲームに対する興味がわくように構成されている。

〔発明が解決しようとする問題点〕

さてかかる従来の遊戯機(2)は、給柄リールの停止位置について、偶然性の要素と停止ボタンを押すという遊戯者のテクニックが入る要素とが入りまじり、非常に楽しめるゲームができる遊戯機として広く用いられている。

しかるに本発明者は、さらに面白いゲームができる遊戯機について鋭意研究を重ねていたところ、通常ゲームにおいて、特定の入賞組合せが当たったとき、給柄リールとは別の手段により小ボーナスゲームや大ボーナスゲームができるチャンス(以下、このゲームを副ゲームという)を与えるようにすればさらに面白いゲームができるであろうことを見出した。

本発明はかかる知見に基づき完成された新た

な剛式遊戯機を提供するものである。

〔問題点を解決するための手段〕

本発明の剛式遊戯機を第1図に基づき説明する。

本発明は、(a)円周面に図程の絵柄が通数個表示された、少なくとも3本の給柄リール(1)、(2)、(3)と、その給柄リール(1)、(2)、(3)を回転させるため、各給柄リール(1)、(2)、(3)のそれぞれに設けられた第1駆動装置(5)、(6)、(7)からなる通常ゲーム手段と、(a)表面に異なる記号が通数個表示された回転体(81)とその回転体(81)を回転させるための第2駆動装置(84)とからなる副ゲーム手段と、(a)第1駆動装置(5)、(6)、(7)のそれぞれに人為的操作により個別に停止信号を与える第1停止手段(10)、(11)、(12)と、(a)回転を停止したときの各給柄リール(1)、(2)、(3)の停止位置を検出する第1検出装置(14)、(15)、(17)と、(a)第1検出装置(14)、(15)、(17)の検出信号に基づき、入賞か否かを判定するとともに、特定の入賞組合せのとき副ゲームの開始信号を発する通常ゲーム判

定手段(31)と、(a)第2駆動装置(84)に停止信号を与える第2停止手段(86)と、(a)回転を停止したときの回転体(81)の停止位置を検出する第2検出装置(87)と、(a)第2検出装置(87)の検出信号に基づき入賞か否かを判定する副ゲーム判定手段(32)と、(a)副ゲーム判定手段(31)の信号または副ゲーム判定手段(32)の信号が入力したときに、配当メダルを払い出すべくホッパを駆動するホッパ駆動手段(33)とを備えたことを特徴としている。

副ゲーム回転体(81)はその表面に数字や図柄などの記号を表示したものであればどのようなものでもよいが、たとえば筒面上に円周状に数字や図柄を表示した円盤や、外側面に数字や図柄を表示したリールなどが用いられる。なお副ゲーム第2停止手段(86)は、人為的操作するものであってもよく、自動的に動作するものであってもよい。

〔作用〕

本発明では、第1駆動装置(5)、(6)、(7)により3本の給柄リール(1)、(2)、(3)が回転させられる。

回転を開始したのち第1停止手段(10)、(11)、(12)を人為的操作すると、操作した時点に対応する回転位置で3本の給柄リール(1)、(2)、(3)が停止する。給柄リール(1)、(2)、(3)が停止したときの、それぞれの回転の停止位置は、第1検出装置(14)、(15)、(17)によりいずれも検出せられる。

以上のようにして、1回の通常ゲームが終了すると、通常ゲーム判定手段(31)により、第1検出装置(14)、(15)、(17)からの停止信号に基づき、各給柄リール(1)、(2)、(3)の停止絵柄が、入賞にかかわる組合せかどうか判定され、特定の入賞のばあい副ゲームの開始信号が発される。

副ゲームは副ゲーム開始信号により回転体(81)が回転を始めることにより開始する。回転体(81)の回転は第2停止手段(86)が動作することにより停止し、停止したときの表示記号が入賞にかかわる組合せかどうかは副ゲーム判定手段(32)により判定される。通常ゲームで普通の入賞が当たればあいは、その時点でホッパ駆動手段(33)が作動し、配当メダルが払い出されて、副

ゲームに移ることなく1回のゲームが終了する。通常ゲームで特定の入賞が当たったばあいには、通常ゲームの配当メダルが払い出されるとともに副ゲームに移る。副ゲームでも入賞が当たったときは、その時点で遊技役物設置や遊技役物増加装置が働き、小ボーナスゲームや大ボーナスゲームが楽しめる。なお通常ゲームで入賞しないばあいには、配当メダルが払い出されることなく、1回のゲームが終了し、副ゲームで入賞しないときも、そのままゲームが終了し、もとの状態にもどる。

【実施例】

つぎに本発明の実施例を説明する。

第1図は本発明の機能説明図、第2a図は本発明の実施例1にかかわる回転式遊技機の正面パネル、第2b~2d図は回転体を構成する円盤の要部正面図、第3図は実施例1の電気回路図、第4図は実施例1のゲーム内容を示すフローチャート、第5図は実施例2のゲーム内容を示すフローチャート、第6図は実施例3のゲーム内容

を示すフローチャート、第7図は実施例4の回転体である副リールの説明図ある。

実施例1

第2a図において、20は本実施例にかかわるスロットマシンの正面パネルである。該正面パネル20の中央には、3個のリール窓21が設けられており、そこからは通常ゲームのための絵柄リール(1)、(2)、(3)の3行分の絵柄が見通せるようになっている。絵柄リール(1)、(2)、(3)は、外周面にたとえば7種類の絵柄が21個、等しいピッチで設けられたコマの中に表示されている。かかる絵柄リール(1)、(2)、(3)は、本体の内部で取付枠に支持されており、それぞれの回転軸には第1駆動装置を構成するステッピングモータ22、23、24が接続されている。なお前記第1駆動装置としては、DCモータやACモータなどの制御用モータを用いることもできる。(1)、(1a)、(1b)、(1c)、(1d)はそれぞれ入賞ラインであり、それらのライン指示線が、リール窓21上に表示されている。

また正面パネル20の上部には、副ゲームのための回転体である円盤(81)が設けられている。この円盤(81)は、本体の内部で取付枠に支持されており、その回転軸には第2駆動装置を構成するステッピングモータ(84)が接続されている。なお前記第2駆動装置としては、DCモータやACモータなどの制御用モータを用いることもできる。

前記円盤(81)は、第2b図に示さるよう、盤面上で円周状に区画されたコマの中に1~12までの数字を表示したものであり、空白のコマも設けられている。また第2c図に示されるように数字のかわりに一重丸あるいは二重丸を表示したもの、さらにそのような丸印のかわりに王冠や星などの図柄を表示したものなどが用いられる。

なお円盤(81)の上部には、1回の数字あるいは図柄だけを指示する停止マーク(71)が設けられる。副ゲームにおける入賞の確率は、全コマ数に対する入賞記号の割合で決定されるので、

設定する入賞確率に応じて、入賞記号の数を決めるとよい。たとえば第2b図の円盤(81)のばあいには、奇数字(6コマ分)が遊技役物の入賞、偶数字(6コマ分)が遊技役物増加の入賞、空白(6コマ分)が外れに割り当てられている。また第2c図の円盤(81)のばあいには、一重丸または星印(6コマ分)が遊技役物の入賞、二重丸または王冠印(6コマ分)が遊技役物増加の入賞、空白(6コマ分)が外れに割り当てられている。

なお以下の説明では第2b図の円盤(81)を用いたばあいについて説明するが、第2c図の円盤(81)についても同様に理解されるべきである。

正面パネル20には以上のほか、入賞時のメダル払出枚数を表示するための払出表示窓25、1ゲームごとに所定枚数のメダルを投入するメダル投入口26、各絵柄リールを起動操作するためのスタートスイッチ27、各絵柄リール(1)、(2)、(3)を停止操作するための、各絵柄リール(1)、(2)、(3)に対応づけられた停止ボタン28、29、30、前記円盤(81)を停止操作するための停止ボタン

図などが設けられている。

つぎに第3図に基づき電気回路を説明する。

(30)はスロットマシンの全体をコントロールするマイクロコンピュータである。かかるマイクロコンピュータ(30)は、入力信号に基づきゲームの進行に必要な比較、判断を行ない。その結果を制御信号として出力するCPU、CPUにおける比較、判断などの手順、それらの実行順序などを定めるプログラム、さらに通常ゲームおよび副ゲームの入賞判定に必要な入賞停止検測や入賞停止数字の組合せデータなどを記憶しておくROM、その他のデータを記憶しておくRAM、外部信号と内部信号のタイミング合せや入出力信号を選択するための入力ポート(38)および制御信号を出力するための出力ポート(35)などから構成されている。

出力ポート(35)には駆動回路(38)を介してステッピングモータ(5)、(6)、(7)が接続されており、CPUからパルス状の制御信号が送られている間、駆動回路(38)から駆動信号が送られステッピン

グモータ(84)が接続されている。該ステッピングモータ(84)はCPUから制御信号が送られている間、駆動回路(38)から駆動信号が送られ回転する。停止ボタン(4)を押したときは、CPUからの駆動信号が停止せられ、ステッピングモータ(84)の回転は停止する。位置検出センサ(87)は円盤(81)の円周上に1カ所設けられたリセット信号を検出するもので、たとえばフォトセンサなどで構成され、円盤(81)の1回転毎に1回のリセット信号を発するようになっている。

さらに出力ポート(35)には、入賞時配当されるメダルを払い出すハッパ(42)、拾りリール(1)、(2)、(3)の回転中、あるいは入賞時にそれぞれ異なる音色のメロディを流すスピーカ(43)、入賞配当メダルの枚数(たとえば2、5、8、10、15枚など)を表示する払出表示器(24)が、それぞれの駆動回路(44)、(45)、(46)を介して接続されている。

本実施例では、電源ONの状態では遊戯者がメダル投入口(9)にメダルを投入したばあい、その

グモータ(5)、(6)、(7)が回転するようになっている。

入力ポート(38)には、スタートスイッチ(4)、各停止ボタン(10、11、12、13)、位置検出センサ(87)、(88)、(89)、メダル検出器(41)がそれぞれ接続されている。なお前記スタートスイッチ(4)の信号線および各停止ボタン(10、11、12、13)の信号線には、それぞれ駆動回路(47)および停止回路(48)が介装されている。前記位置検出センサ(87)、(88)、(89)は、各拾りリール(1)、(2)、(3)の円周上に1カ所設けられたリセット信号部を検出するもので、たとえばフォトセンサなどで構成され、各拾りリール(1)、(2)、(3)の1回転毎に1回のリセット信号を発するようになっている。

前記メダル検出器(41)は、メダル投入口(9)にメダルが投入されたこと、および枚数を検知するもので、マイクロスイッチやフォトセンサなどが用いられる。

また出力ポート(35)と入力ポート(38)の間には、円盤(81)を回転させるためのステッピン

グ出力信号がメダル検出器(41)よりCPUに送られ、CPUはスロットマシンを稼働状態にするとともに、スピーカ(43)にも駆動信号を発して、予め定められたメロディを流すようにしている。

この状態で遊戯者がスタートスイッチ(4)を押すと、駆動信号がCPUに取りこまれ、CPUからはステッピングモータ(5)、(6)、(7)に同時に駆動信号が発せられて、拾りリール(1)、(2)、(3)は一斉に回転を始める。このあと遊戯者が各停止ボタン(10、11、12)を押すと停止信号がCPUに取りこまれ、直ちにCPUからの駆動信号が停止せられて、拾りリール(1)、(2)、(3)の回転が停止する。なおステッピングモータ(5)、(6)、(7)は駆動信号に接続に反応して回転するので、遊戯者の押しボタン操作があると、ほぼ同時に停止する。そのため、遊戯者は、各停止ボタン(10、11、12)の押し順序、時間間隔を自由に選択して、各拾りリール(1)、(2)、(3)を思い通りの位置に停止させようすることができる。

通常ゲーム判定手段(31)および副ゲーム判定

手段(12)は、マイクロコンピュータ(30)でソフト処理することにより実現せられる。

通常ゲームの入賞判定はつぎのようにして行われる。CPUは位置検出センサ(4、5、6)から各給所リール(1)、(2)、(3)の1回転毎に入力されるリセット信号のうち、最終のリセット信号の入力された時点から、停止信号が入力されて各ステップモータ(4、5、6)への駆動信号の発信が停止されるまでの間の駆動信号のパルス数をカウントする。各給所リール(1)、(2)、(3)に現わされている給所の1コマ分を回転させるに必要な駆動信号のパルス数はあらかじめ判っているため、カウントパルス数により、各給所リール(1)、(2)、(3)の何コマ目がリール窓(7)に現われて停止しているかが判定される。入賞を判定するためにROMの所定エリアには入賞にかかわる給所の何種類かの組合せが記憶されている。CPUはカウントパルス数をインデックスとして、ROM中の情報とを比較する。比較結果が一致すれば、入賞であり、入賞の種類も判断される。

これでゲームオーバーとなる。

第4図に示す実施例では、従来のゲーム機で遊技役物および遊技役物増加とされていた入賞を通常ゲームから除き、特定の入賞のときに副ゲームに移行し、副ゲームにおいて遊技役物および遊技役物増加の入賞を当てさせるようになっている。かかる特定の入賞が当たると、円盤(81)が回転しはじめ(105)、副ゲームが開始する。本実施例では副ゲーム開始後に前記特定の入賞の配当メダルの払出し(108)が行なわれるようになっているが、もちろん副ゲームの開始前に、すなわち通常ゲームの終了直後に払出しを行なってもよい。遊技者が停止ボタン(4)を押すと(107)、円盤(81)が回転を停止する。そしてこのときの停止数字が偶数であれば、遊技役物増加(大ボーナス)の入賞、奇数であれば遊技役物(小ボーナス)の入賞、空白であれば外れとマイクロコンピュータ(30)により判定される(108)。副ゲームでいずれの入賞もしないばあい、直ちにゲームオーバーとなるが、入賞した

副ゲームの入賞判定は、CPUにおいて、位置検出センサ(17)よりのリセット信号に基づき、前記給所リール(1)、(2)、(3)のばあいと同様にし、円盤(81)の停止数字を検知し、ROM内の入賞組合せと比較することにより入賞か否かを判定する。

通常ゲームの判定および副ゲームの判定のうち、CPUよりホッパへ向け駆動信号が発せられると、それによりホッパが駆動され、メダルが払い出される。

以上のごとき実施例におけるゲーム内容を第4図に基づき説明する。

電源ONの状態で遊技者がメダルをメダル投入口(9)に入れ、スタートスイッチ(10)を押すと、給所リール(1)、(2)、(3)が回転を始め(101)、ゲームがスタートする。そののち遊技者が停止ボタン(4)、(5)、(6)を任意に押していくと(102)、給所リール(1)、(2)、(3)がそれぞれのボタン操作時に対応した位置で停止する(103)。この時点で入賞判定が行われ(104)、入賞しないばあいは

ばあいは、遊技役物装置あるいは遊技役物増加装置が働き、その後小ボーナスゲーム(109)または大ボーナスゲーム(110)が楽しめる。

以上のごとき本実施例では、第4図におけるステップ(101)～ステップ(104)までの通常ゲームに加え、ステップ(105)～ステップ(110)までの副ゲームを実行することができるので、非常に楽しみの多いゲームができるのである。

実施例2

本実施例を第5図に基づき説明する。なお同図には、通常ゲームの部分は実施例1のばあいと同様なので示されておらず、第4図におけるステップ(104)以降のみ示されている。

本実施例においては、遊技役物(小ボーナス)の入賞が通常ゲーム中に接され、遊技役物増加(大ボーナス)の入賞のみ副ゲームで当てるようになっている。すなわち給所リール(1)、(2)、(3)からは遊技役物増加の入賞給所が外されている。

この実施例においては、第24図に示された円

盤(81)が好適である。この円盤(81)では、盤面上で円周状に区画されたコマの中に特定の数字たとえば「7」が通数個表示されており空白のコマも設けられている。停止マーク(71)の位置で数字が表示されたコマが停止すれば入賞であり、空白のコマが停止すれば外れとなる。なお前記数字のかわりに王冠の図柄などを表示しておいてもよい。この円盤のばあい、副ゲームにおける入賞の確率は50%となっている。

ステップ(104)において通常ゲームの入賞判定がなされ、あらかじめ定められた入賞が当たると、円盤(81)が回転して(105)、副ゲームを開始し、同時に入賞配当のメダルが払い出される(106)。つぎに遊戯者が停止ボタン10を押すと(107)、円盤(81)の回転が停止し、マイクロコンピュータ10により停止数字の組合せから、副ゲームの入賞判定が行われる(108)。判定の結果、入賞すれば、大ボーナスゲームが実行できる(109)。外れであれば、ゲームオーバーとなる。なお通常ゲームにおけるステップ(104)の判定

入賞配当のメダルが払い出される(108)。つぎに遊戯者が停止ボタン10を押すと、円盤(81)の回転が停止し、マイクロコンピュータ10により停止数字の組合せから、副ゲームの入賞判定が行われる(108)。判定の結果、入賞すれば、小ボーナスゲームが実行できる(110)。外れであれば、ゲームオーバーとなる。なお通常ゲームにおけるステップ(104)の判定で連続役物増加の入賞が当たれば、入賞配当メダルが払い出された(111)のち、大ボーナスゲームが実行できる(112)。

実施例4

第1図に基づき本実施例を説明する。本実施例は副ゲーム手段の回転体としてリール(以下、副リール(82)という)を用いている。副リール(82)は絵柄リール(11)、(12)、(13)とはほぼ同様の構成のものが用いられるが、それらより小形であってもよい。その円周面上には数字や図柄などの記号が表示され、そのうちの一部分がリール窓(72)中に現われるようになっている。

で連続役物の入賞が当たれば、入賞配当メダルが払い出された(108)のち、小ボーナスゲームが実行できる(109)。

実施例3

本実施例を第6図に基づき説明する。なお、同図には通常ゲームの部分は実施例1のばあいと同様なので示されておらず、第4図におけるステップ(104)以降のみ示されている。

本実施例においては、連続役物増加(大ボーナス)の入賞が通常ゲーム中に致され、連続役物(小ボーナス)の入賞のみ副ゲームで当てさせるようになっている。すなわち絵柄リール(11)、(12)、(13)からは連続役物の入賞絵柄が外されている。この実施例のばあい、第24図の円盤(81)が好適であるが、表示記号は、たとえば星印の図柄などが好ましい。しかし特定の数字を表示したものであってもよい。

ステップ(104a)において入賞判定がなされ、あらかじめ定められた入賞が当たると、円盤(81)が回転して(105)副ゲームを開始し、同時に入

本実施例では、リール窓(72)の側に設けられた停止マーク(73)の位置で、予め定められた入賞記号が停止したとき、入賞と判定されるようになっている。

実施例5

前記各実施例においてはいずれも円盤(81)や副リール(82)などへの制御信号の発信停止は、第1図に示されている1個の停止ボタン10で行っているが、停止ボタンを一切設けることなく、一定の時間(たとえば2~3秒)経過すると自動的に停止信号が発信されるようにしてもよい。

以上に本発明の各実施例を説明したが、本発明はかかる実施例に限られず、その要旨を逸脱しない範囲で種々の変更例を採用することができる。

【発明の効果】

本発明によると、通常ゲームで入賞したときは、たんに入賞配当を手に入れるだけでなく、あわせて副ゲームも行うことができるので、興趣あるゲームを楽しむことができる。

4 図面の簡単な説明

第1図は本発明の機能説明図、第2a図は本発明の実施例1にかかわる回転式遊戯機の正面パネルの正面図、第2b～2d図は回転体を構成する円盤の要部正面図、第3図は実施例1の電気回路図、第4図は実施例1のゲーム内容を示すフローチャート、第5図は実施例2のゲーム内容を示すフローチャート、第6図は実施例3のゲーム内容を示すフローチャート、第7図は実施例4の回転体である副リールの説明図、第8～9図は従来の遊戯機の説明図、第10図は従来のゲーム内容を示すフローチャートである。

(図面の主要符号)

- (1)、(2)、(3)：絵柄リール
(4)、(5)、(7)、
(14)：ステッピングモータ
(15)：スタートスイッチ
(16)、(17)、(18)：停止ボタン
(19)、(20)、(21)：停止ボタン
(22)：位置検出センサ

- (30)：マイクロコンピュータ
(31)：通常ゲーム判定手段
(32)：副ゲーム判定手段
(33)：ホッパ駆動手段
(41)：メダル検出器
(42)：ホッパ
(81)：リール
(82)：副リール

特許出願人 東京パブコ株式会社 ほか1名
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図1

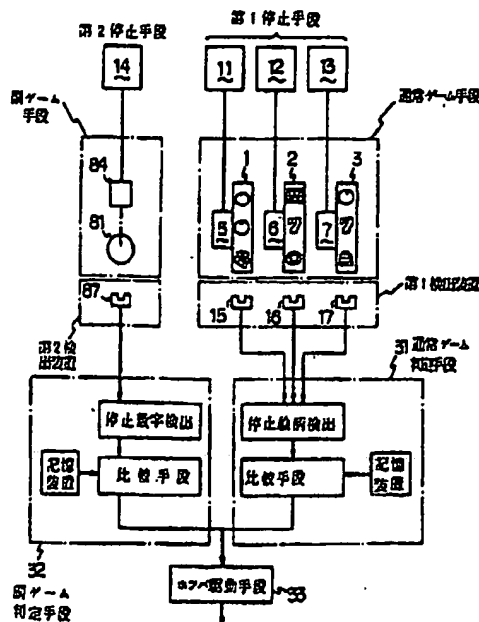


図2a

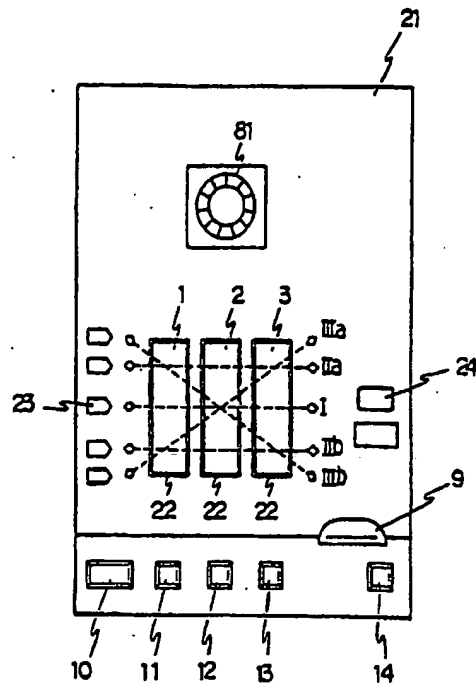


図 4

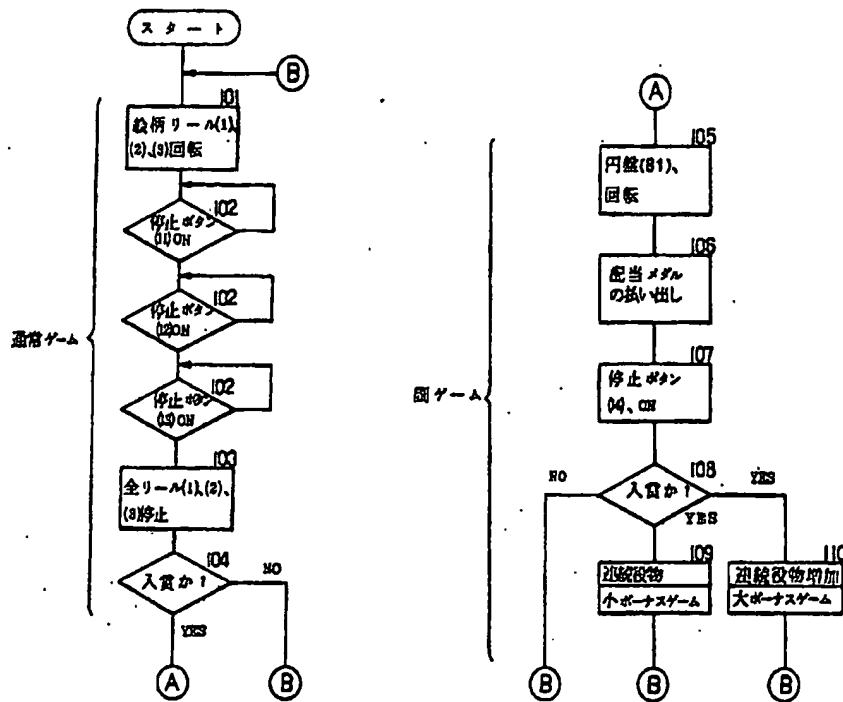


図 6

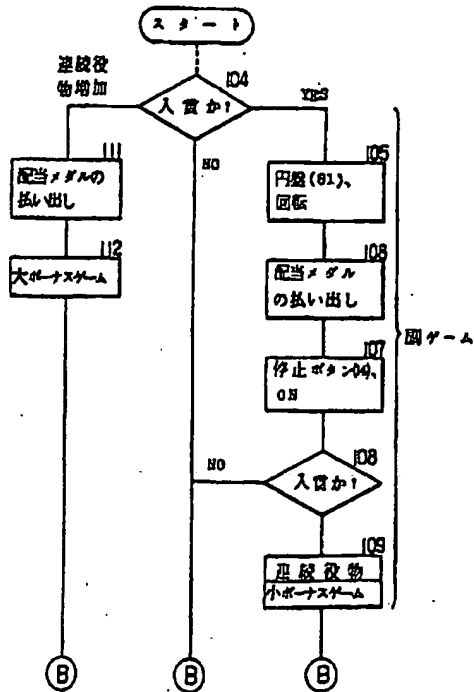


図 8

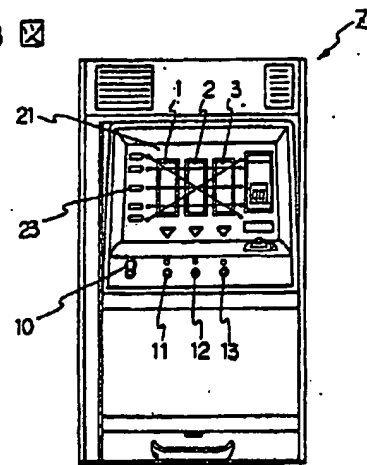
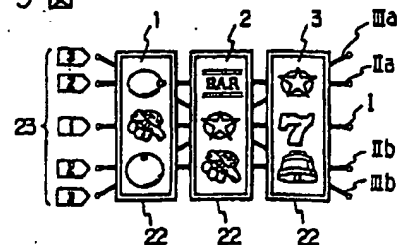


図 9



特開昭 62-254786 (11)

手 記 補 正 書 (自発)

昭和 51 年 5 月 7 日

特許庁長官 平賀 通郎 殿

1 事件の表示

昭和 51 年特許願第 97650 号

2 発明の名称

囲碁式遊戯機

3 補正をする者

事件との関係 特 許 出 願 人

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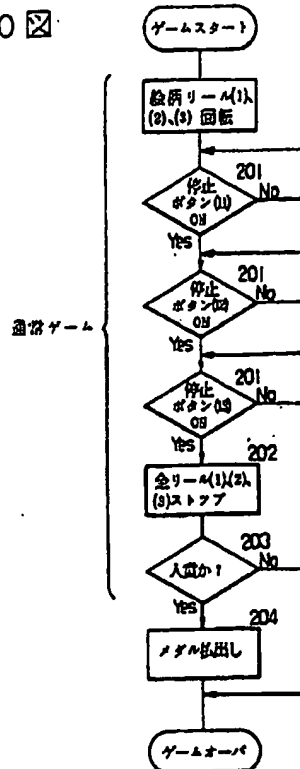
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ほか 1 名

61.6.91

才 10 図



5 補正の対象

(1) 明細書の「発明の詳細な説明」の欄

6 補正の内容

(1) 明細書 14 頁 8 行の「遊戯役物の」を「遊戯
役物増加の」と補正する。

以 上

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TRANSLATION FROM JAPANESE

Japan Patent Office (JP) Patent Publication (A) Publication of Patent Application
62 - 254786
Published: 6th November 1987

(51) Int. Cl.	Identification symbol	Internal Ref. No.	FI	Technical designation
A 63 F9/00	102	B-8102-2C		

Examination: requested
No. of claims: 1 (Total : 11 pages)

(54) Title of the Invention:	Rotating drum type amusement machine
(21) Application No.:	S61-97650
(22) Application Date:	26 th April 1986

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SPECIFICATION

1. Title of the Invention

Rotating drum type amusement machine

2. Claims

1. A rotating drum type amusement machine comprising:
 - a) normal game means consisting of at least three picture reels having pictures of different types depicted on the circumferential faces thereof, and first driving devices, provided respectively for each of the picture reels, for causing said picture reels to rotate;
 - b) subsidiary game means consisting of a rotating member having a suitable number of differing symbols depicted on the surface thereof, and a second driving device for causing said rotating member to rotate;

- c) first stopping means for supplying stop signals individually to the respective first drive devices, in accordance with a deliberate operation;
- d) first detecting devices for detecting the stop positions of the respective reels when the rotation thereof is halted;
- e) normal game judging means for judging whether or not a prize has been won on the basis of the detection signals from the first detecting devices, and issuing a start signal for a subsidiary game in the case of a particular prize combination;
- f) second stopping means for supplying a stop signal to the second drive device;
- g) a second detecting device for detecting the stop position of the rotating member when the rotation thereof has halted;
- h) subsidiary game judging means for judging whether or not a prize has been won on the basis of the detection signal from the second detecting device; and
- i) hopper driving means for driving a hopper in such a manner that it pays out corresponding tokens, when a signal from said normal game judging means or a signal from said subsidiary game judging means is input thereto.

3. Detailed Description of the Invention

(Industrial Applicability)

The present invention relates to a rotating drum type amusement machine, as typified by a slot machine. More particularly, it relates to a rotating drum type amusement machine which can be played with greater interest.

(Prior Art)

A rotating drum type amusement machine, such as a slot machine, generally uses three picture reels provided with a cylindrical face depicting a plurality of pictures, these reels being caused to rotate and the respective picture reels then being stopped by a player pressing stop buttons provided for each reel, whereby the respective picture reels are caused to stop at random, and a prize is determined according to the combination of pictures in a previously determined the prize line, a prescribed number of tokens being paid out if the player has won a prize.

Figs. 8 to 9 show an approximate front view of a conventional rotating drum type amusement machine (Z) of this kind, and a prize line in a front panel (21) and picture reels, or the like, as viewed through a reel window.

The aforementioned rotating drum type amusement machine (Z) is also known as a "slot machine", and comprises a box-shaped housing, inside which are

accommodated three picture reels (1), (2), (3), motors for causing same to rotate, and other control devices and the like. 21 pictures of 7 different types, for example, are depicted in a random order on the respective outer circumferences of each of the aforementioned picture reels (1), (2), (3). Moreover, on the front panel (21) of the front upper portion of the machine, there are provided: a reel window (22) so that the player can see through to the pictures on the picture reels (1), (2), (3); a start switch (10) for causing the respective picture reels (1), (2), (3) to rotate; stop buttons (11), (12), (13) for stopping the rotation of the aforementioned picture reels (1), (2), (3), independently; a token input slot (9); a line display device (23) for displaying the positions and number of prize lines; and the like.

In this amusement machine (Z), five prize lines are provided corresponding to the three rows of picture reels (1), (2), (3) appearing in the reel window (22), and a prescribed position and number of prize lines can be selected mechanically from these five prize lines, by means of the number of tokens input. In other words, the machine is previously set up in such a manner that, if the number of tokens input by the player to the token input slot (9) is one token, then only the centre line (I) is selected, and in the case of two tokens, the lines above and below the centre line (I), namely (IIa), (IIb), are added to provide three prize lines, whilst if three tokens are input, then the diagonal lines (IIIa), (IIIb) are also added to provide five prize lines.

The game in this conventional amusement machine (Z) consists of one, three or five prize lines being selected according to the number of tokens input by the player to the token input slot (9), whereupon the line display device (23) indicating the prize lines lights up to inform the players the number and positions of the prize lines. The player then presses the start switch (10), causing the respective picture reels (1), (2), (3) to rotate, and thereby starting the game. Thereupon, as illustrated in Fig. 10, when the player presses the stop buttons (11), (12), (13), respectively, in a desired sequence (201), the picture reels (1), (2), (3) stop rotating, and when all of the picture reels (1), (2), (3) have stopped (202), a prize is determined according to the combination of pictures which have stopped on the aforementioned prize lines (203). If a prize has been won, then a prescribed number of tokens are paid out (204) (hereinafter, this game is called "normal game").

The rotational speed of the respective picture reels (1), (2), (3) described above is a speed whereby the pictures on the outer circumferences are difficult to discern clearly, and in most cases, the player simply presses the stop buttons (11), (12), (13), at

random, but to some extent, he or she is able to stop the picture reels (1), (2), (3) at desired stop positions, in a deliberate manner. Therefore, a rotating drum type amusement machine (Z) of this kind stimulates the interest of the player, sufficiently, and allows him or her to play an interesting game.

In a conventional amusement machine (Z) of this kind, in order to further increase the interest generated by the game, it has also become possible to play a continuation bonus game using one picture reel only, in addition to the aforementioned normal game. A continuation bonus game is also known generally as a small bonus game, wherein, after the picture reels have rotated and each picture reel has been stopped, one at a time, if any one of the picture reels has stopped at a picture indicating a continuation bonus, then a prescribed number of tokens are paid out.

A continuation bonus game can be achieved by operating a built-in continuation bonus device, if a prescribed prize combination is obtained in the prize combinations of the normal game. Moreover, it is also possible to adopt a composition comprising a continuation bonus increasing device which allows large bonus games to be played by increasing the number of games of the continuation bonus game itself, thereby further enhancing the player's interest in the game.

(Problems to be Solved by the Invention)

The conventional amusement machine (Z) described above is widely used to play very entertaining games wherein the stopping position of the picture reels are determined by a combination of an element of chance and an element of the player's skill in pressing the stop buttons in a deliberate fashion.

As a result of continued and thorough research into amusement machines which might enable more interesting games to be played, the present inventor discovered that a more interesting game might be possible if a chance for playing a small bonus game or large bonus game (hereinafter, called "subsidiary game") could be imparted by some means other than the picture reels, when a particular prize combination is obtained in a normal game.

The present invention provides a new rotating drum type amusement machine completed on the basis of this finding.

(Means for Solving the Problems)

The rotating drum type amusement machine according to the present invention is now described on the basis of Fig. 1.

The present invention is characterized in that it comprises: (a) normal game means consisting of at least three picture reels (1), (2), (3) having pictures of different types depicted on the circumferential faces thereof, and first driving devices (5), (6), (7), provided respectively for each of the picture reels (1), (2), (3), for causing said picture reels (1), (2), (3) to rotate; (b) subsidiary game means consisting of a rotating member (81) having a suitable number of differing symbols depicted on the surface thereof, and a second driving device (84) for causing said rotating member (81) to rotate; (c) first stopping means (11), (12), (13) for supplying stop signals individually to the respective first drive devices (5), (6), (7), in accordance with a deliberate operation; (d) first detecting devices (15), (16), (17) for detecting the stop positions of the respective reels (1), (2), (3) when the rotation thereof is halted; (e) normal game judging means for judging whether or not a prize has been won on the basis of the detection signals from the first detecting devices (15), (16), (17), and issuing a start signal for a subsidiary game in the case of a particular prize combination; (f) second stopping means (14) for supplying a stop signal to the second drive device (84); (g) a second detecting device (87) for detecting the stop position of the rotating member (81) when the rotation thereof has halted; (h) subsidiary game judging means (32) for judging whether or not a prize has been won on the basis of the detection signal from the second detecting device (87); and (i) hopper driving means (33) for driving a hopper in such a manner that it pays out corresponding tokens, when a signal from said normal game judging means (31) or a signal from said subsidiary game judging means (32) is input thereto.

The aforementioned rotating member (81) may be of any form, provided that symbols, such as numerical figures, images, or the like, are depicted on the surface thereof, and for example, a circular disc having numerical figures or images depicted on a circumferential fashion on the surface of the disc, or a reel having numerical figures or images depicted on the outer circumference thereof, may be used. The aforementioned second stopping means (14) may also be operated by deliberate human operation, or it may be operated automatically.

(Action)

In the present invention, three picture reels (1), (2), (3) are caused to rotate by first drive devices (5), (6), (7). When first stopping means (11), (12), (13) are operated intentionally after the reels have started to rotate, then the three picture reels (1), (2), (3) are stopped at rotational positions corresponding to the times at which they were

operated. The rotational stopping positions of the respective picture reels (1), (2), (3) when they are halted are detected respectively by first detecting devices (15), (16), (17).

In this way, when one round of a normal game ends, it is determined by normal game determining means (31) whether or not the stopped pictures of the respective picture reels (1), (2), (3) form a combination corresponding to a prize, on the basis of the stop signals from the first detecting devices (15), (16), (17), and if a prize has been won, then a start signal for a subsidiary game is issued.

The subsidiary game begins with a rotating member (81) starting to rotate in accordance with said start signal. The rotation of the rotating member (81) is halted by operation of second stopping means (14), and subsidiary game determining means (32) then determines whether or not the symbols displayed when it stops form a combination corresponding to a prize. If a standard prize was obtained in the normal game, then at this point, hopper driving means (33) operates and pays out corresponding tokens, and one round of the game finishes without proceeding to the subsidiary game. If a particular prize is obtained in the normal game, then the tokens corresponding to the normal game are paid out, and the machine then also transfers to the subsidiary game. If a prize is won in the subsidiary game, then at that point, the continuation bonus device or continuation bonus increasing device is activated, and a small bonus game or large bonus game can be played. Moreover, if no prize is won during the normal game, then one round of the game ends without any tokens being paid out, and if no prize is won in the subsidiary game, then the game ends directly, and the machine returns to its original state.

(Embodiments)

Next, embodiments of the present invention will be described.

Fig. 1 is a functional diagram of the present invention; Fig. 2a shows a front panel of a rotating drum type amusement machine relating to a first embodiment of the present invention; Fig. 2b - 2d shows principal front views of circular discs forming rotating members; Fig. 3 is an electrical circuit diagram of the first embodiment; Fig. 4 is a flow chart showing the game contents of the first embodiment; Fig. 5 is a flowchart showing the game contents of a second embodiment; Fig. 6 is a flowchart showing the game contents of a third embodiment; and Fig. 7 is an explanatory diagram of a subsidiary reel forming a rotating member according to a fourth embodiment.

In Fig. 2a, (21) is a front panel of a slot machine relating to the present embodiments. Three reel windows (22) are provided in the centre of said front panel

(21), through which three lines of pictures on picture reels (1), (2), (3) for a normal game can be viewed. The picture reels (1), (2), (3) have, for example, 21 pictures of 7 different types depicted on the outer circumferences thereof, within boxes provided at equal pitch. These picture reels (1), (2), (3) are supported by an installation frame on the inside of the main unit, and stepping motors (5), (6), (7) constituting first driving devices are connected respectively to the rotational shafts thereof. Control type motors, such as DC motors or AC motors, may be used as the aforementioned first driving devices. (I), (IIa), (IIb), (IIIa), (IIIb) are respective prize lines, and lines indicating these prize lines are depicted on the reel windows (22).

A circular disc (81) forming a rotating member for a subsidiary game is provided on the upper portion of the front panel (21). This circular disc (81) is supported on an installation frame inside the main unit, and the rotational shaft thereof is connected to a stepping motor (84) constituting a second driving device. A control type motor, such as a DC motor or AC motor, may be used for said second driving device.

As illustrated in Fig. 2b, said circular disc (81) shows figures from 1 to 12 within boxes demarcated in circumferential fashion on the disc, on which blank boxes are also provided. Moreover, as shown in Fig. 2c, a disc depicting single circles or double-circles instead of the aforementioned figures, or a disc depicting pictures, such as diamond or star shapes, or the like, instead of these circle symbols, may also be used.

A stopping mark (71) indicating one figures or picture is provided above the circular disk (81). The probability of winning a prize in the subsidiary game is set by a ratio of the prize symbols compared to the total number of boxes, and therefore, the number of prize symbols should be determined in accordance with the desired prize probability. For example, in the case of the circular disk (81) in Fig. 2b, the odd numbers (6 boxes) are allocated to continuation bonus prizes, the even numbers (6 boxes) are allocated to continuation bonus increase prizes, and the blank boxes (8 boxes) are allocated to no prize. Moreover, in the case of the circular disk (81) in Fig. 2c, the single circle symbols or star symbols (6 boxes) are allocated to continuation bonus prizes, the double circle symbols or diamond symbols (6 boxes) are allocated to continuation bonus prizes [*sic*], and the blank boxes (8 boxes) are allocated to no prize.

The following description relates to a case where a circular disk (81) as shown in Fig. 2b is used, but the case of a circular disk (81) as shown in Fig. 2c should also be understood similarly.

In addition to the foregoing, there are also provided on the front panel (21): a payment display device (24) for displaying the amount of tokens to be paid out when a prize is won; a token input slot (9) for inserting a prescribed number of tokens for each game; a start switch (10) for activating the respective picture reels; stop buttons (11), (12), (13) provided corresponding to each of the picture reels (1), (2), (3), for stopping the respective picture reels (1), (2), (3); a stop button (14) for stopping the aforementioned circular disk (81); and the like.

Next, an electrical circuit is described on the basis of Fig. 3. (30) is a microcomputer for controlling the entire slot machine. This microcomputer (30) performs the necessary comparisons and judgements required in implementing the game, on the basis of input signals, and it comprises: a CPU for outputting these results as control signals; a ROM for storing procedures for making comparisons and judgements in the CPU, programs for determining the order in which such steps are implemented; and combination data, and the like, for the prize-winning stop pictures and the prize-winning stop figure required to determine prize winning in a normal game and a subsidiary game; a RAM for storing other data; and an input port (36) for selecting the timing combination of external signals and internal signals, and input/output signals, and an output port (35) for outputting control signals (35).

The stepping motors (5), (6), (7) are connected via a drive circuit (38) to the output port (35), in such a manner that whilst a pulse-shaped control signal is supplied from the CPU, a drive signal is transmitted by the drive circuit (38), thereby causing the stepping motors (5), (6), (7) to rotate.

The start switch (10), respective stop buttons (11), (12), (13), (14), respective detection sensors (15), (16), (17), and the token output device (41) are connected respectively to the input port (36). An start up circuit (47) and stopping circuit (48) are interposed respectively in the signal line from the aforementioned start switch (10) and the signal line from the respective stop buttons (11), (12), (13), (14). Said position detecting sensors (15), (16), (17) detect a reset signal section provided at one point on the circumference of each of the picture reels (1), (2), (3), and are constituted by photosensors, for example, in such a manner that they issue a reset signal once for each revolution of the picture reels (1), (2), (3).

Said token detecting section (41) detects the fact that tokens have been input to the token input slot (9), and the number of tokens thus input, and a micro-switch, photosensor, or the like, may be used for same.

Moreover, a stepping motor (84) for causing the circular disk (81) to rotate is connected between the output port (35) and input port (36). This stepping motor (84) receives a drive signal from the drive circuit (39), whilst a control signal is issued by the CPU, whereby it is caused to rotate. When the stop button (14) is pressed, the drive signal from the CPU is halted, and the rotation of the stepping motor (84) stops. A position detecting sensor (87) detects a reset signal provided at one point on the circumference of the circular disk (81), and is constituted by a photosensor, for example, in such a manner that it issues one reset signal for each revolution of the circular disk (81).

The output port (35) is connected, via respective drive circuits (44), (45), (46), to: a hopper (42) for paying out corresponding tokens when a prize has been won; a speaker (43) for playing different tuneful melodies when different prizes are won; and a payout display unit (24) for displaying the number of tokens corresponding to the prize (for example, 2, 5, 8, 10 or 15 tokens).

In this embodiment, when a player inputs a token to the token input slot (9) with the power supply switched on, a detection signal for same is sent to the CPU by the token detecting unit (41), and the CPU sets the slot machine to an active state, whilst also issuing a drive signal to the speaker (43) in such a manner that a previously determined melody is played.

In this state, if the player then presses the start switch (10), then a start signal is fed to the CPU, which in turn issues drive signals simultaneously to the stepping motors (5), (6), (7), whereby the picture reels (1), (2), (3) all start to rotate. Thereupon, if the player presses one of the stop buttons (11), (12), (13), a stop signal is fed to the CPU, and immediately, the drive signal from the CPU is halted and the rotation of the picture reels (1), (2), (3) is halted. The stepping motors (5), (6), (7) rotate precisely in reaction to the drive signals, and when the player performs a push button operation, they halt almost instantaneously. Therefore, the player is able to freely select the order and time intervals by which he or she presses the stop buttons (11), (12), (13), so as to halt the respective picture reels (1), (2), (3) in desired positions.

Normal game determining means (31) and subsidiary game determining means (32) are achieved by software processing in the microcomputer (30).

Judgement of prizes in a normal game is performed in the following manner. The CPU counts the number of pulses of the drive signal from the time at which the last reset signal was input, of the reset signals input at each revolution of the picture reels

(1), (2), (3) from the position detecting sensors (15), (16), (17), to the time at which the stop signal is input and the transmission of the drive signal to the stepping motors (5), (6), (7) is halted. Since the number of pulses of the drive signal required to rotate one picture box section depicted on the picture reels (1), (2), (3) is already known, it can be judged which boxes of each picture reel (1), (2), (3) appear in the reel window (22), according to the counted number of pulses. In order to judge prize winning, the combinations of different types of pictures which relate to prize winning are stored in a prescribed area of the ROM. The CPU takes the number of counted pulses as an instance, and compares this with the information in the ROM. If the compared information matches, then a prize has been won, and the type of prize is also determined.

Judgement of prize winning in a subsidiary game is performed by means of the CPU detecting the stopped figure on the circular disk (81), on the basis of the reset signal from the position detecting sensor (87), similarly to the case of the picture reels (1), (2), (3) described above, and then determining whether or not a prize has been won by comparing this figure with prize combinations in the ROM.

After judgement for a normal game and judgement for a subsidiary game, if the CPU issues a drive signal to the hopper, the hopper is drive thereby to pay out tokens.

The game contents according to the aforementioned embodiment will now be described on the basis of Fig. 4.

With the power supply switched on, when a player inserts a token to the token input slot (9) and presses the start switch (10), the picture reels (1), (2), (3) start to rotate (101), and the game starts. Thereupon, when the player presses the respective stop buttons (11), (12), (13), as desired (102), the picture reels (1), (2), (3) stop at positions corresponding to the times at which the respective stop buttons were operated (103). At this time, prize winning is determined (104), and if no prize has been won, then the game ends directly.

In the embodiment shown in Fig. 4, prizes such as a continuation bonus and continuation bonus increase in a conventional game machine are removed, and when a particular prize is won, the machine proceeds to a subsidiary game, in which continuation bonus and continuation bonus increase prizes are won. When the aforementioned-particular prize is won, the circular disk (81) starts to rotate (105), thereby starting a subsidiary game. In the present embodiment, the payout (100) of tokens corresponding to said particular prize is performed after the subsidiary game has

started, but of course, it may be performed before the subsidiary game starts, in other words, directly after the normal game has ended. When the player presses the stop button (14) (107), the circular disk (81) stops rotating. If the figure at which the disc has stopped is an even number, then a continuation bonus increase (large bonus) is determined by the microcomputer (30), and if it is an odd number, then a continuation bonus (small bonus) is determined, whereas if it is blank, then no prize is determined (108). If neither type of prize is won in the subsidiary game, then the game ends directly, but if a prize has been won, then the continuation bonus device or continuation bonus increasing device is activated, whereby a small bonus game (109) or large bonus game (110) can be played.

As described above, in the present embodiment, in addition to the normal game in step (101) to step (104), it is also possible to play a subsidiary game from step (105) to step (110), and therefore many extremely enjoyable games can be played on the machine.

Second Embodiment

This embodiment is described on the basis of Fig. 5. The portion relating to the normal game is the same as in the first embodiment, and is therefore not depicted in this diagram, and only the portion from step (104) in Fig. 4 onwards is depicted.

In this embodiment, the continuation bonus (small bonus) prize is left within the normal game, and only the continuation bonus increase (large bonus) prize is playable in the subsidiary game. In other words, the prize pictures for the continuation bonus increase are omitted from the picture reels (1), (2), (3).

In this embodiment, the circular disk (81) shown in Fig. 2d is appropriate. In this circular disk (81), an appropriate number of particular numerical figures, such as "7", are depicted in boxes demarcated along the circumference of the disc surface, and blank boxes are also provided thereon. If the disc stops with a box depicting a figure at the position of the stop mark (71), then a prize is won, and if it stops with a blank box at this position, then no prize is won. It is also possible to depict images, such as diamonds, or the like, instead of the aforementioned numerical figures. In the case of this disc, the probability of winning a prize in the subsidiary game is 50%.

At step (104), prize judgement for a normal game is carried out, and if a previously determined prize is won, then the circular disk (81) is rotated (105), thereby starting a subsidiary game, and simultaneously, tokens corresponding to the prize are paid out (106). When the player subsequently presses the stop button (14) (107), the

rotation of the circular disk (81) is halted and the microcomputer (30) determines the prize for the subsidiary game, from the combination of stopped figures (108). If, as a result of this judgement, a prize has been won, then a large bonus game can be played (109). If no prize has been won, then the game ends. If a continuation bonus prize is won in the judgement operation at step (104) for a normal game, then tokens corresponding to the prize are paid out (106), whereupon a small bonus game can be played (109).

Third embodiment

This embodiment is described on the basis of Fig. 6. The portion relating to the normal game is the same as in the first embodiment, and is therefore omitted from the diagram, which only depicts processing from step (104) in Fig. 4 onwards.

In the present embodiment, the continuation bonus increase (large bonus) prize is left within the normal game, and the continuation bonus (small bonus) prize only is played in the subsidiary game. In other words, the prize pictures for the continuation bonus are omitted from the picture reels (1), (2), (3). In the case of this embodiment, the circular disk (81) in Fig. 2d is appropriate, and the displayed symbols are desirably images, such as star symbols, for example. However, it is also possible to depict a particular numerical figure.

At step (104a), prize judgement is performed, and if a previously determined prize is won, then the circular disk (81) is rotated (105), thereby starting the subsidiary game, whilst simultaneously, tokens corresponding to the prize are paid out (106). Thereupon, when the player subsequently presses the stop button (14), the rotation of the circular disk (81) stops, and the microcomputer (30) performs prize judgement for the subsidiary game according to the combination of stopped figures (108). If, as a result of this judgement, a prize has been won, then a small bonus game can be played (110). If no prize has been won, then the game ends. If a continuation bonus increase prize was won in the judgement operation at step (104) for the normal game, then after tokens corresponding to the prize have been paid out (111), a large bonus game can be played (112).

Fourth embodiment

This embodiment is described on the basis of Fig. 7. In this embodiment, a reel (hereinafter called subsidiary reel (82)) is used as a rotating member for the subsidiary game means. The subsidiary reel (82) used is of virtually the same composition as the picture reels (1), (2), (3), but it may be formed to a smaller size than same. Symbols,

such as numerical figures, images, or the like, are depicted on the circumference surface thereof, in such a manner that a portion thereof is visible through the reel window (72).

In this embodiment, if a previously determined prize symbol stops at the position of the stop mark (73) provided to the side of the reel window (72), then it is judged that a prize has been won.

Fifth embodiment

In the respective embodiments described above, the halting of the issuing of the control signal to either the circular disk (81) or the subsidiary reel (82), or the like, is performed by one stop button (14) as illustrated in Fig. 1, but it is also possible for the halt signal to be issued automatically when a prescribed period of time (for example, 2 - 3 seconds) has elapsed, without providing any halt button.

Various embodiments of the present invention have been described above, but the present invention is not limited to these embodiments, and it is possible to adopt various modifications without departing from the essence of the invention.

(Merits of the Invention)

According to the present invention, if a prize is won in a normal game, then rather than simply obtaining a corresponding prize, it is also possible to play a subsidiary game as well, thereby providing a game which is interesting to play.

4. Detailed Description of the Drawings

Fig. 1 is a functional diagram of the present invention; Fig. 2a is front view of a front panel of a rotating drum type amusement machine relating to a first embodiment of the present invention; Figs. 2b - 2d are principal front views of a circular disc constituting a rotating member; Fig. 3 is an electrical circuit diagram of the first embodiment; Fig. 4 is a flowchart showing the game contents of the first embodiment; Fig. 5 is a flowchart showing the game contents of a second embodiment; Fig. 6 is a flowchart showing the game contents of a third embodiment; Fig. 7 is an explanatory diagram of a subsidiary reel forming a rotating member according to a fourth embodiment; Fig. 8 to Fig. 9 are explanatory diagrams of a conventional amusement machine; and Fig. 10 is a flowchart showing game contents according to the prior art.

(Principal symbols in the drawings)

(1), (2), (3) picture reel

(5), (6), (7)

(84) stepping motor

(10) start switch

(11), (12), (13), (14) stop button

(15), (16), (17), (87) position detecting sensor

(30) microcomputer

(31) normal game judging means

(32) subsidiary game judging means

(33) hopper driving means

(41) token detecting unit

(42) hopper

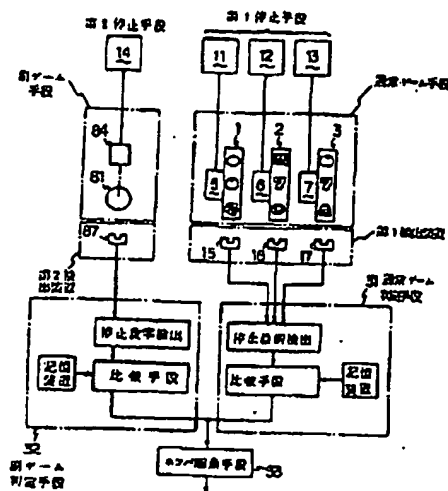
(81) circular disk

(82) subsidiary reel

Applicant Tokyo Pabuko K.K. (and one other)

Agent Sota Asahina (and one other)

Fig. 1



Key to figure, left to right, top to bottom:

Second stopping means

First stopping means

Subsidiary game means

Normal game means

First detecting device

Second detecting device

31 normal game judging means

Stopped figure detection

Stopped picture detection

Storage unit

Comparator means

Comparator means

Storage unit

32 Subsidiary game judging means

33 Hopper driving means

Fig. 2a

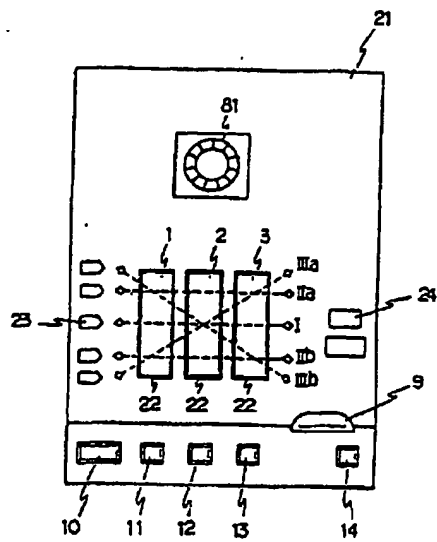


Fig. 2b

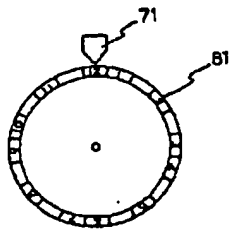


Fig. 2c

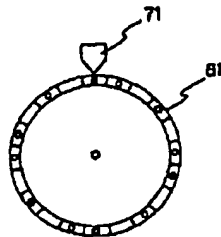


Fig. 2d

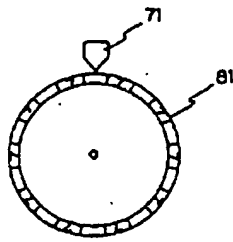
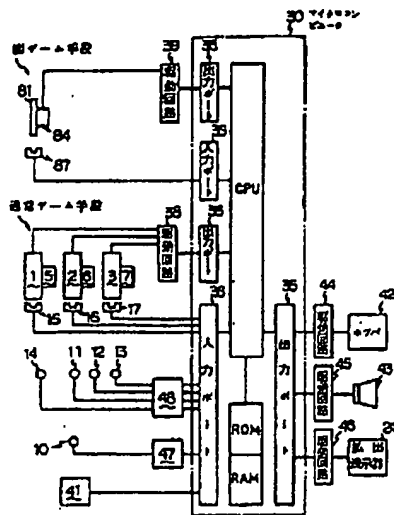


Fig. 3



Key to figure, left to right, top to bottom:

Subsidiary game means

39 Drive circuit

35 Output port

36 Input port

Normal game means

35 Output port

38 Drive circuit

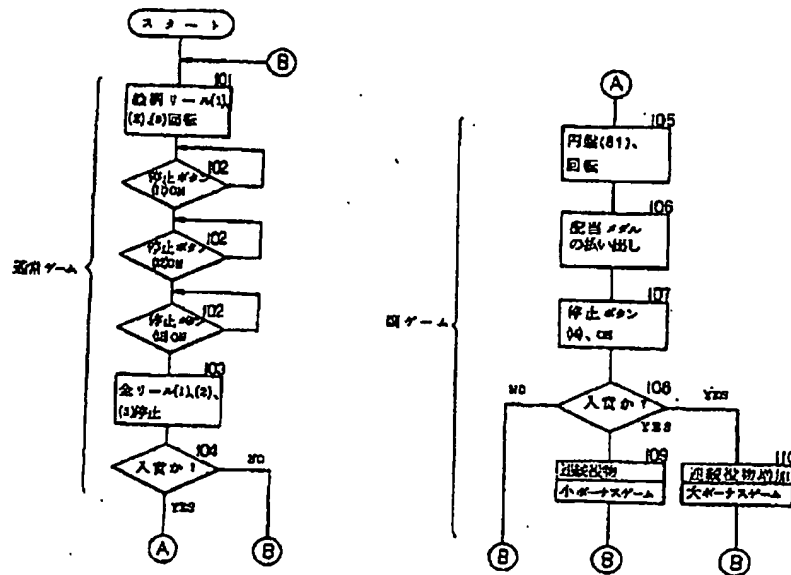
35 Output port

36 Input port

44 Drive circuit

45 Drive circuit
46 Drive circuit
42 Hopper
24 Payout display unit

Fig. 4



Key to figure, top to bottom, left to right:

START

101 Rotate picture reels (1), (2), (3)

102 Stop button (14) ON

102 Stop button (14) ON

Normal game

102 Stop button (14) ON

103 Stop all reels (1), (2), (3)

104 Prize won?

Right side:

105 Rotate circular disc (81)

106 Pay out corresponding tokens

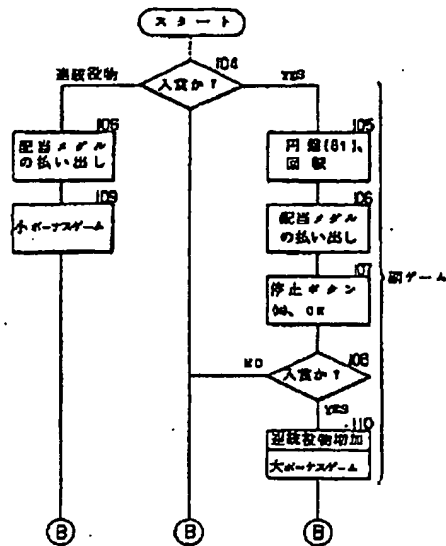
107 Stop button (14) ON

Subsidiary game

108 Prize won?

- 109 Continuation bonus
Small bonus game
- 110 Continuation bonus increase
Large bonus game

FIG. 5



Key to figure, left to right, top to bottom:

START

Continuation bonus

104 Prize?

106 Pay out corresponding tokens

105 Rotate circular disc (81)

109 Small bonus game

106 Pay out corresponding tokens

107 Stop button (14) ON

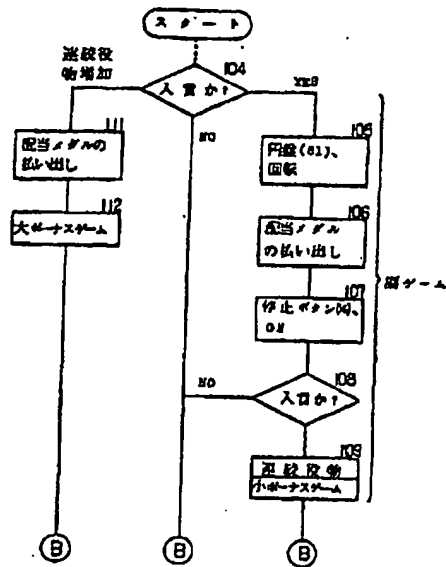
Subsidiary game

108 Prize won?

110 Increase continuation bonus

Large bonus game

Fig. 6



Key to figure, left to right, top to bottom:

START

Continuation bonus increase

104 Prize won?

111 Pay out corresponding tokens

105 Rotate circular disc (81)

112 Large bonus game

106 Pay out corresponding tokens

Subsidiary game

107 Stop button (14) ON

108 Prize won?

109 Continuation bonus

Small bonus game

Fig. 7

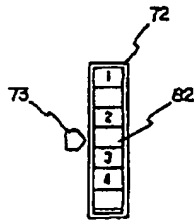


Fig. 8

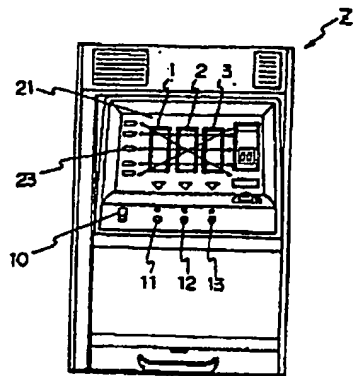


Fig. 9

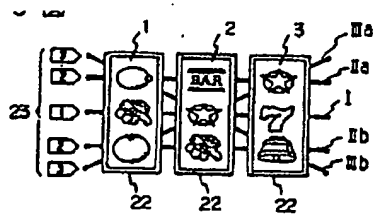
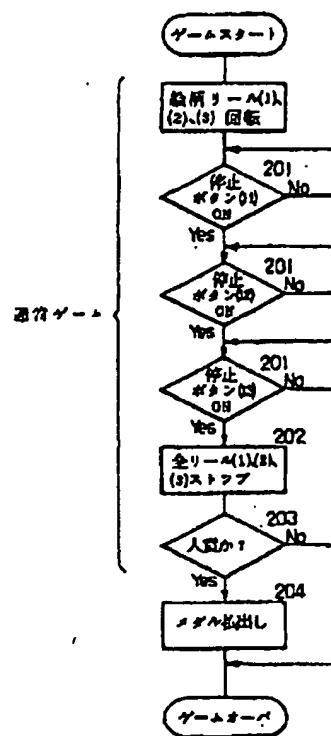


Fig. 10



Key to figure, top to bottom, left to right:

Game Start

Rotate picture reels (1), (2), (3)

201 Stop button (11) ON

201 Stop button (12) ON

Normal game

201 Stop button (13) ON

202 Stop all reels (1), (2), (3)

203 Prize won?

204 Pay out tokens

GAME OVER

Procedural Amendment

7th June 1986

Patent Governor's Office

1. Indication of case

Showa 61 Application No. 97650

2. Title of invention

Rotating drum type amusement machine

3. Party effecting amendment

Relationship to case Applicant

Address

Name Tokyo Pabuko K.K.

and one other

4. Agent T540

Address

Name (6522) Sota Asahina Patent Attorney

Tel : (06) 943-8922

and one other

5. Object of amendment

(1) "Detailed Description of the Invention" in Specification.

6. Details of amendment

(1) Page 14, line 8: "continuation bonus ..." amended to "continuation bonus increase ..."

END